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Academic Leadership Development (ALD) Program at College of Medicine, Jeddah;
King Saud bin Abdulaziz University for Health SciencesPage 4

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At the beginning of the year, I would like to wish everybody a peaceful and prosperous year. I hope that this year will bring peace to war torn areas in the Middle East and elsewhere.

Middle East Journal of Family Medicine did not go where the path may lead, we went instead where there is no path and left a trail. The journal over the last fourteen years has inspired others to dream more, to learn more. In addition I would like to thank the production team in Australia headed by Ms Lesley Pocock who accomplished great things, through acting, dreaming, planning and above all believing in the value of the Journal. For our readers and contributor we wish them to reach high, for the stars that lie hidden in their soul.

In this issue a paper from Jeddah assessed the perception of academic leaders on the importance of capability, different approaches and criterion for judging effective performance. The authors did a cross-sectional online survey with 47 academic leaders at COM-J. In addition to demographic data, information on academic leaders' perception of the importance of three datasets (capabilities, approaches and judging criteria) was collected using a five-point Likert scale (1 - low to 5 - high). The response rate was 100% (47), and the academic leaders perceived that a combination of emotional intelligence (both personal and interpersonal), cognitive capabilities and a set of relevant skills and knowledge are necessary for effective performance as an academic leader at COM-J. The authors concluded that the

produced model for an ALD program at COM-J with the following attributes: A set of capabilities and competencies for effective leadership at COM-J. A set of quality checkpoints (criterion for judging effective performance) at COM-J. An online tool to enable future leaders to complete the same survey and compare their responses.

A prospective descriptive study conducted at department of surgery Erbil Teaching Hospital -Erbil, Kurdistan Region of Iraq. The objective of the study is to compare new method of ganglion management, efficacy of resolution, frequency of complications and recurrence of managing dorsal wrist ganglions with aspiration followed by intra-cystic injection of Methylprednisolone and surgical excision and our new procedure Silk thread passed in cross manner. A total of 785 patients were included in this study, 120 cases had been excluded from study because they lost follow-up. All patients were thoroughly examined to exclude the other causes of wrist swelling. The patients were divided into three groups A, B & C according to their choice of treatment. Group A were treated by surgical excision, Group B were treated by aspiration followed by steroid injection and group C by Silk thread passed in cross manner. Patient's satisfaction was higher in Group C after Silk thread passed in crisscross manner followed by surgical excision even if the ganglions recurred. The recurrence rate was 4 % in Silk thread passed and 24% surgical excision group and 43% in aspiration with steroid injection in group B. The authors concluded that Silk thread passed in cross manner had better results compared to surgical excision and to aspiration and injection.

A Cross sectional study of 646 adult Saudi patients assess the prevalence of vitamin D deficiency at both gender and age groups. 559 participants out of 646 had vitamin D deficiency (86.5%) (<50nmol/l), with more deficiency among males than females (89.3% vs. 84.7%), however the proportion of females who had severe deficiency (<25 nmol/l) was higher than males (40.7% vs. 32.4%) with P value = 0.006. The authors concluded that in contrast to current concepts, this study showed that male and younger patients had higher rates of vitamin deficiency; the exact reasons need to be carefully sought.

Measles, mumps, rubella and varicella are diseases that are tracked by the World Health Organization (WHO) as common and serious vaccine-preventable diseases. A cross-sectional study conducted on 180 children in Benha. All children included in this study were subjected to -thorough history taking and laboratory investigations; to measure serum levels of specific measles, rubella, mumps and varicella immunoglobulins. The objectives were to evaluate the immune status and susceptibility against measles, mumps, rubella, and varicella in primary school children and to study the effects of some sociodemographic factors on the seroprevalence. (88.9%) of the surveyed children were seropositive to measles, (77.8%) to mumps, (86.7%) to rubella and (38.9%) to varicella. Seropositivity was higher in males than in females for measles (57.7%), mumps (60.7%), rubella (62.2%) and varicella (68.6%) with significant difference for measles. Younger age groups were less seropositive than older age groups for measles (32.5% vs 35%), mumps (34.4 % vs 37.9%) , rubella (30.8 % vs 39.7 %) and for varicella (21.4%) vs 48.6%). The highest level of seronegativity was seen with regard to varicella specific antibodies (61.1%). The authors concluded that there is an urgent need for a planned program with different strategies to prevent and control these diseases is needed.

An extensive review is included in this issue on Motivating People to Protect Their Sexual Health . Sexually transmitted diseases (STD) are among the most common causes of illness in the world. It is estimated that there is at least one new STD consultation per 100 persons per year in developed countries, while in many developed nations STD rank among the top few diseases for which health care services are sought. In addition to the 20 or more microorganisms that are predominately transmitted by sexual activity have been joined during the last decade by the human immunodeficiency virus (HIV), which leads to AIDS. These diseases continue to be an important threat to the human and economic resources of communities.

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Academic Leadership Development (ALD) Program at College of Medicine, Jeddah; King Saud bin Abdulaziz University for Health Sciences

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Abstract

Introduction: The new Medical College in Jeddah (COM-J) - a branch of King Saud bin Abdulaziz University for Health Sciences - is currently confronting many challenges, accelerating the need for effective academic leaders. Unfortunately, little is known about how the competency of academic leaders underpins effective performance or how leaders might be aided in acquiring competency. This environment has driven authorities at COM-J to be proactive in the establishment of the Academic Leadership Development (ALD) program for current and potential future academic leaders.

Objectives: To assess the perception of academic leaders on the importance of capability, different approaches and criterion for judging effective performance.

Methodology: A cross-sectional online survey was conducted with 47 academic leaders at COM-J. In addition to demographic data, information on academic leaders' perception of the importance of three datasets (capabilities, approaches and judging criteria) was collected using a five-point Likert scale (1 - low to 5 - high). The project team and experts in the field of leadership development assessed the face validity of the survey instrument. The reliability of the survey instrument was calculated; Cronbach's coefficient alpha was 0.97 (a high value).

Program Model: In response to the need mentioned in the introduction, we have adopted a model of academic leadership development that has already been tested in several large-scale studies of effective leadership in higher education.

This model suggests an ongoing process with 4 stages; Diagnosis, Development, Implementation and Evaluation. Areas of good practice are retained, and those requiring further attention and new gaps for development are re-addressed.

Results: The response rate was 100% (47), and the academic leaders perceived that a combination of emotional intelligence (both personal and interpersonal), cognitive capabilities and a set of relevant skills and knowledge are necessary for effective performance as an academic leader at COM-J.

Conclusion: We produced a model for an ALD program at COM-J with the following attributes:

- A set of capabilities and competencies for effective leadership at COM-J.
- A set of quality checkpoints (criterion for judging effective performance) at COM-J.
- An online tool to enable future leaders to complete the same survey and compare their responses.

Key words: Education, leadership

Introduction

Leadership development can be described as the “longitudinal process of expanding the capacities of individuals, groups, and organizations to increase their effectiveness in leadership roles and processes” (1).

Academic leadership is critical in higher education because it influences the quality of student learning (2). In Saudi Arabia, the Ministry of Higher Education and leading Saudi universities have recognized that leadership plays a significant role in the success, effectiveness and quality of higher education. Thus, the Ministry established the Academic Leadership Center (ALC) in 2009 to give focus and emphasis to this critical issue. Based on an initial plan, the ALC organized numerous developmental activities to serve some of the needs of Saudi higher education institutions and administrators. These activities included successful workshops for rectors, vice rectors, academic deans and department chairs (3).

The new Medical College in Jeddah (COM-J) - a branch of King Saud bin Abdulaziz University for Health Sciences - is confronting many challenges, which accelerates the need for effective academic leaders. Unfortunately, little is known about how the competency of academic leaders underpins effective performance or how leaders might be aided in acquiring competency. This environment has driven authorities at COM-J to be proactive in the establishment of the Academic Leadership Development (ALD) program for current and potential future academic leaders.

Middlehurst et al (4) question is there a difference between leadership in higher education and other organizations; they believe that there is no difference (4).

Bryman (5) reviewed literature to determine effective leadership styles in HE and found that as there is no consistency in the literature in using key terms it was difficult to form a cumulative view (Bryman, 2009).

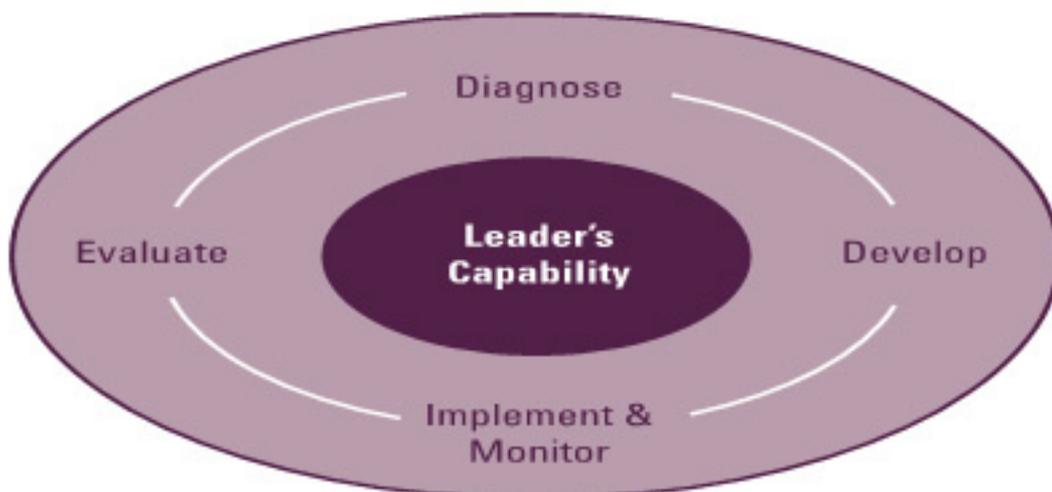
Although leadership is widely distributed across universities, it is often subject to ‘a somewhat individualistic and management approach’ (6).

The literature shows that very limited professional development has been provided for academic leaders. For example, only three percent of over 2000 academic leaders surveyed in the United States’ national studies from 1990 to 2000 had leadership development programs at their universities (7).

However, in some developed countries, attempts have been made to provide support for the academic leaders. For example, in the United States, the American Council on Education has been offering a series of general national workshops for more than 40 years. In England, the Leadership Foundation for Higher Education was founded in 2004 by the UK government to provide support and advice on leadership and management for all UK University and higher education colleges. In Australia, in 2007, the federal government funded the LH Martin Institute for Higher Education Leadership and Management to meet the need for high quality leadership in higher education (8).

In higher education, a competency-based approach is an effective tool for leadership development (9). Scott et al. (10) proposed a model for academic leadership development (increasing a leader’s capability) that is shown in Figure 1. This model suggests that professional learning for academic leaders will follow an action learning cycle that involves an ongoing process to identify the “gaps” in one’s capabilities using the leadership scales and dimensions and then addresses these gaps using a mixture of self-managed learning, practice-based learning, and appropriately timed and linked formal leadership development. As this process unfolds, the results can be monitored using effectiveness indicators, and the quality of what has emerged can be evaluated. Areas of good practice are retained, and those requiring further attention and new “gaps” for development are re-addressed. In this

Figure 1: Model of Academic Leadership Development



manner, the cycle continues. It is critical to view the process not only as cyclical but also as heading somewhere significant based on the validated capability and focus scales that are identified in the current study.

In response to the above-stated needs, we adopted this model, which has already been tested in several large-scale studies of effective leadership in higher education led by Geoff Scott, Hamish Coates and Michelle Anderson (10)(13). However, as Bryman (5) reported that any leadership framework that ignores context is ineffective, a competency model created in one context cannot be assumed to be generalizable to other contexts. It was therefore important to contextualize this model for COM-J.

Methodology

This project proposal began in April 2013 and the needs assessment part of it, began in August 2013 and the main fieldwork was concluded in November 2014.

A range of background reviews were conducted - reviews of research literature and policy reports, and of operating environments to provide a vital contextual dimension to the project. The survey instrument was adopted from a prior study of higher education leaders led by Geoff Scott, Hamish Coates and Michelle Anderson (10)(13). Initially, insights from the background reviews were used to refine the instrument. The instrument was further revised and enhanced, and then deployed in a data collection.

2.1 Study Setting:

The study was performed at the College of Medicine in the King Saud bin Abdulaziz University for Health Sciences, in Jeddah, Saudi Arabia. These classes were located within King Abdulaziz Medical City, National Guard Health Affairs. Classes began in the academic year (2010/2011 - 1431/1432) and adopted problem-based learning curriculum. Currently, there are 143 students and 128 (joint 106 & 22 full-time) faculty staff.

2.2 Study Population:

This study limited its definition of leaders to people in academic roles, representing people who are positioned as formal leaders at COM-J. A total of 47 academic leaders - the entire population - were included: one dean, three associate deans, five chairmen, thirty block coordinators and co-coordinators, and eight college council members.

2.3 Study Design:

In this cross-sectional study, an online survey was conducted for 47 academic leaders focusing on the following:

1. **Part 1:** Academic leaders' relevant demographic data
2. **Part 2:** Academic leaders' perception of the relative importance of sets of leadership capabilities to identify priority areas:

- Personal capabilities
- Interpersonal capabilities
- Cognitive capabilities
- Leadership competencies 3.

Part 3: Academic leaders' perception of the relative effectiveness of different approaches to developing these capabilities

4. Part 4: Academic leaders' perception of indicators that can be used to evaluate their effectiveness

The respondents quantitatively rated the importance of items using a five-point Likert scale (1 - low to 5 - high). The target leaders were invited by email to participate in the survey and were given an explanation of the survey's purpose and significance. Follow-up emails were sent at weekly intervals, and the researcher undertook personal follow-up when necessary. The survey was field-tested before distribution and was designed for online completion in approximately 20 minutes using a Qualtrics online survey. The responses were confidential and were not linked to information on the sampling frame. The data collection was completed by early November 2013.

2.4 Data Management and Analysis

The data analysis addressed each of the study's objectives and included a summary of the means and ordinal ranks across the academic roles.

2.5 Validation & reliability

This model has already been validated in large-scale studies, as previously noted. The project team and one expert assessed the validity of the instrument. The reliability of the survey instrument was calculated: Cronbach's coefficient alpha was 0.97 (a high value) for all questions, and each individual question varied from 0.8 to 0.93.

2.6 Ethical Considerations:

The nature of this project highlights many ethical issues, these are:

- 1) Get an official approval from the Master Program of medical education; Department of Medical education ; college of medicine ; king Saudi bin Abdulaziz University for health science (KSAU - HS)
- 2) Get Approval from COM-J authority to conduct this project.
- 3) Confidentiality - Because academic leaders may be sharing very personal information. Participants should not normally be named (unless their permission has been explicitly sought, and this should only be done where a name is essential for the pursuit of the research in question).
- 4) Informed consent - part of the online survey. This usually required that respondents agreeing to participate, after being informed of potential risks and benefits.
- 5) Promises and reciprocity - The issue here is what the participants get in return for sharing their time and insights.

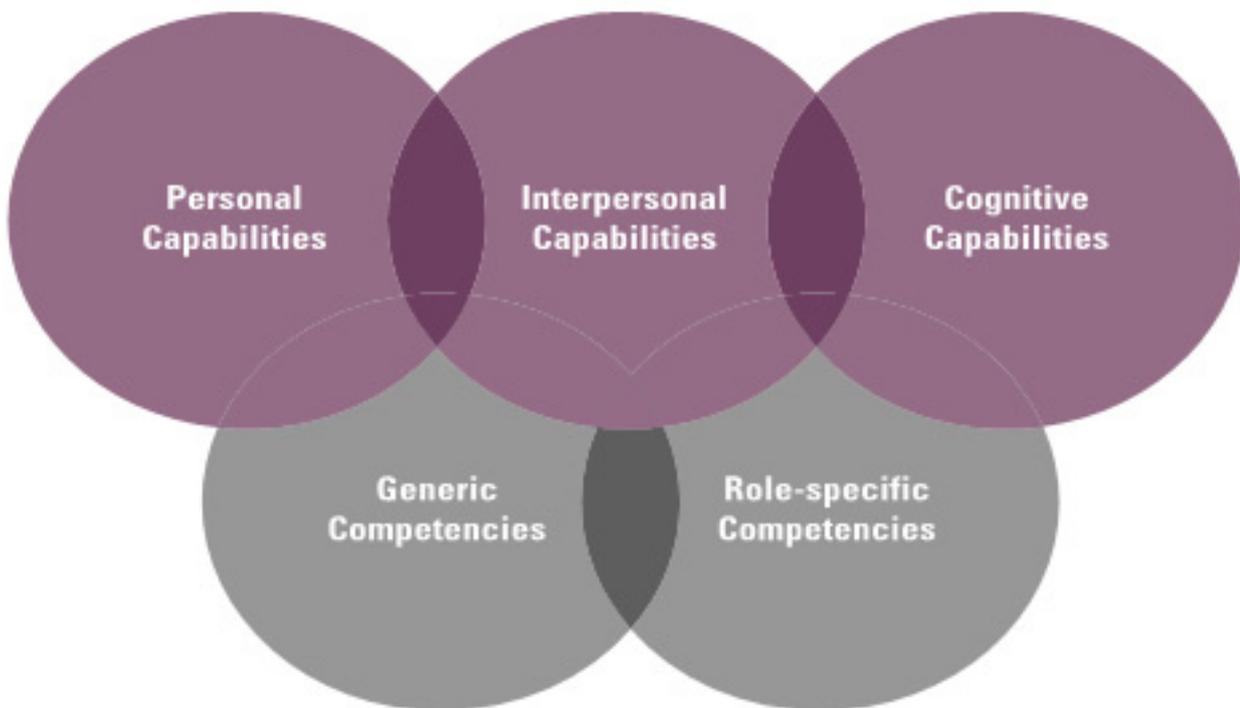
Results

The main results will be divided into three parts including the leader's capability model, approaches for academic leadership development at COM-J, and criterion for judging effective performance.

3.1 Leader's Capability Model

Leaders' capability consists of five domains as seen in Figure 2. Each domain was given operational definitions by an inventory of 56 items. Furthermore, these items were clustered into 11 different scales.

Figure 2: Academic Leadership Capability Domains



3.1.2 Domain 2: Inter-Personal Capability

Table 1 reports the importance ratings for the interpersonal capabilities items. All are rated highly

Table 1: Interpersonal capabilities of all academic leaders at College of Medicine, Jeddah

Rank	Interpersonal Capabilities	Average Value
1	Working constructively and being honest in dealing with other	4.72
2	Motivating others to achieve positive outcomes	4.70
3	Listening to different points of view before reaching a decision	4.66
4	Emphasizing and working productively with staff and other people from a wide range of backgrounds	4.62
5	Developing and contributing positively to learning-based programs	4.50
6	Giving and receiving constructive feedback to/ from work colleagues and others	4.49
7	Emphasizing and working productively with students from a wide range of backgrounds	4.40
8	Developing and using networks of colleagues to solve key workplace problems	4.40
9	Understanding how different groups that make up my university operate and influence different situations	4.34
10	Influencing people's behavior and decisions in effective ways	4.34
11	Working with very senior people within and beyond my university without being intimidated	4.17

3.1.3 Domain 3: Cognitive capabilities

All items used to measure the cognitive dimension of leadership capability were rated highly by the COM-J leaders Table 2.

Table 2: Cognitive Capabilities of all Academic Leaders at College of Medicine, Jeddah

Rank	Cognitive Capabilities	Average Value
1	Having a clear, justified and achievable direction in my area of responsibility	4.63
2	Using previous experience to figure out what is occurring when a current situation takes an unexpected turn	4.60
3	Making sense of and learning from experience	4.59
4	Diagnosing the underlying causes of a problem and taking appropriate action to address it	4.59
5	Setting and justifying priorities for my daily work	4.57
6	Thinking creatively and laterally	4.48
7	Adjusting a plan of action in response to problems that are identified during its implementation	4.44
8	Recognizing patterns in a complex situation	4.28
9	Seeing and then acting on an opportunity for a new direction	4.28
10	Identifying from a mass of information the core issue or opportunity in any situation	4.26
11	Seeing the best way to respond to a perplexing situation	4.24
12	Tracing out and assessing the likely consequences of alternative courses of action	4.22
13	Knowing that there is never a fixed set of steps for solving workplace problems	4.07
14	Recognizing how seemingly unconnected activities are linked	3.96

3.1.4 Domains 4 and 5: Leadership competencies

All leadership competencies are ranked highly (mean above 4) with the exception of competency associated with understanding of industrial relations and processes as they apply to higher education. The highest levels of importance were attached to the following: Being able to organize work and manage time effectively; the ability to chair meetings effectively; being able to make effective presentations for a range of different groups; the comprehension for how to develop an effective higher education learning program; and being able to help staff learn how to deliver necessary changes effectively.

3.1.5 All the Domain Scales

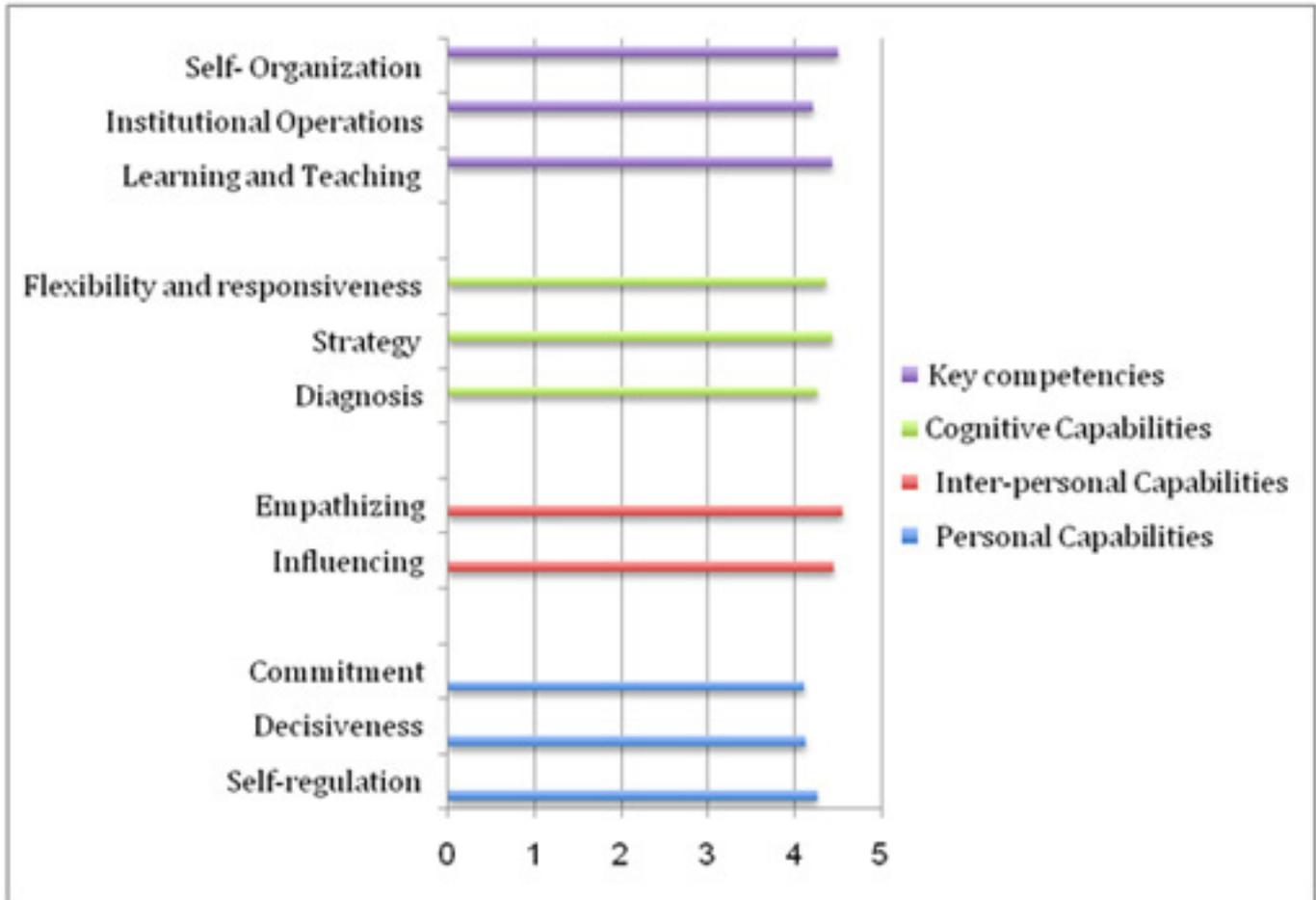
The academic leaders perceived that all the domains of the leader's capability model were important for effective leadership at COM-J. The average scores of the scales within the main domains are reported in Figure 3 - opposite page.

3.2 Approaches for academic leadership development at COM-J.

The 47 academic leaders were asked to rate the effectiveness of each of the learning approaches in assisting their development as an academic leader (1 [low] to 5 [high]).

In general, the leaders at COM-J expressed a preference for attending learning and teaching conferences, participating in higher education leadership seminars, learning 'on-the-job', and participating in leadership development programs that are tailored to their needs more than completing formal leadership programs given by external providers or even by the university.

Figure 3: Leadership Capability Importance (average scale score)

Table 3: Indicators of Leadership Effective Performance by role (items ranks)
Only the first 5 ranks are reported here out of 26 indicators.

Item	Criterion for judging effective performance	Dean Associate Deans	Chairmen	Block Coordinators & Co-coordinators	College Council Members	All Leaders
1	Producing significant improvements in learning and teaching quality	7	3	1	2	1
2	Delivering successful team projects in learning teaching	16	14	2	5	2
3	Producing future learning and teaching leaders	5	7	4	7	3
4	Receiving positive user feedback for your area of responsibility	8	2	7	1	4
5	Producing successful learning systems or infrastructure	10	12	5	8	5

In this study, respondents were asked to rate the importance of each indicator as a criterion for judging effectiveness in their role. There were 26 indicators ranked by leader roles. The results of the survey of the whole group (all academic leaders)

1) Personal Capability of all academic leaders at COM-J

Rank	Personal Capabilities Academic Leaders	Average Value
1	Understanding my personal strengths and limitations	4.72
2	Being true to one's personal values and ethics	4.70
3	Having energy, passion and enthusiasm for learning and teaching	4.51
4	Wanting to achieve the best outcome possible	4.51
5	Remaining calm under pressure or when things take an unexpected turn	4.50
6	Admitting to and learning from my errors	4.40
7	Being willing to take a hard decision	4.36
8	Maintaining a good work/ life balance and keeping things in perspective	4.35
9	Taking responsibility for program activities and outcomes	4.34
10	Deferring judgment and not jumping in too quickly to resolve a problem	4.15
11	Being confident to take calculated risks	4.04
12	Persevering when things are not working out as anticipated	3.69
13	Bouncing back from adversity	3.68
14	Pitching in and undertaking menial tasks when needed	3.39
15	Tolerating ambiguity and uncertainty	3.33

2) Inter-personal Capabilities of all academic leaders at COM-J

Rank	Inter-personal Capabilities Academic Leaders	Average Value
1	Working constructively and honest in dealing with others	4.72
2	Motivating others to achieve positive outcomes	4.70
3	Listening to different point of view before coming to a decision	4.66
4	Emphasizing and working productively with staff and other players from a wide range of backgrounds	4.62
5	Developing and contributing positively to learn-based programs	4.50
6	Giving and receiving constructive feedback to/ from work colleagues and others.	4.49
7	Emphasizing and working productively with students from a wide range of backgrounds	4.40
8	Developing and using networks of colleagues to solve key workplace problems	4.40
9	Understanding how the different groups that make up my university operate and influence different situations	4.34
10	Influencing people's behavior and decisions in effective ways	4.34
11	Working with very senior people within and beyond my university without being intimidated	4.17

3) Cognitive Capabilities of all academic leaders at COM-J

Rank	Cognitive Capabilities Academic Leaders	Average value
1	Having a clear, justified and achievable direction in my area of responsibility	4.63
2	Using previous experience to figure out what's going on when a current situation takes an unexpected turn	4.60
3	Making sense of and learning from experience	4.59
4	Diagnosing the underlying causes of a problem and taking appropriate action to address it	4.59
5	Setting and justifying priorities for my daily work	4.57
6	Thinking creatively and laterally	4.48
7	Adjusting a plan of action in response to problems that are identified during its implementation	4.44
8	Recognizing patterns in a complex situation	4.28
9	Seeing and then acting on an opportunity for a new direction	4.28
10	Identifying from a mass of information the core issue or opportunity in any situation	4.26
11	Seeing the best way to respond to a perplexing situation	4.24
12	Tracing out and assessing the likely consequences of alternative courses of action	4.22
13	Knowing that there is never a fixed set of steps for solving workplace problems	4.07
14	Recognizing how seemingly unconnected activities are linked	3.96

4) Skills and Knowledge of all academic leaders at COM-J

Rank	Skills And Knowledge Academic Leaders	Average value
1	Being able to organize my work and manage time effectively	4.70
2	An ability to chair meetings effectively	4.65
3	Being able to make effective presentations to a range of different groups	4.65
4	Understanding how to develop an effective higher education learning program	4.52
5	Being able to help my staff learn how to deliver necessary changes effectively	4.41
6	Having sound administrative and resource management skills	4.40
7	Knowing how to identify and disseminate good learning and management practice across the unit or university	4.39
8	Being able to use IT effectively to communicate and perform key work functions	4.39
9	Being able to manage my own ongoing professional learning and development	4.39
10	Understanding how to implement successfully a new higher education program	4.37
11	Being on top of current developments in learning and teaching	4.37
12	Having a high level of up-to-date knowledge of what engages university students in productive learning	4.33
13	Understanding how to design and conduct an evaluation of a higher education learning program	4.28
14	Understanding how universities operate	4.23
15	Understanding the role of risk management and litigation in my work	4.13
16	Understanding of industrial relations and processes as they apply to higher education	3.72

5) Support for Leadership (all academic leaders at COM-J)

Rank	Support For Your Leadership Development Academic Leaders	Average value
1	Attending learning and teaching conferences	4.20
2	Participating in higher education leadership seminars	4.17
3	Learning 'on-the-job'	4.13
4	Participating in leadership development programs which are custom-tailored to your needs	4.11
5	Study of 'real-life' workplace problems	4.04
6	Being involved in formal mentoring/ coaching programs	4.04
7	Completing formal leadership programs given by external providers	4.04
8	Participating in 360 degree feedback reviews based in known leadership capabilities	4.00
9	Completing formal leadership programs provided by your university	3.96
10	Undertaking site visits to other institutions or agencies	3.93
11	Ad hoc conversation about work with people in similar roles	3.91
12	Participating in peer networks within the university	3.89
13	Accessing leadership information on the Internet	3.89
14	Being involved in informal mentoring/ coaching	3.87
15	Participating in annual performance reviews	3.78
16	Undertaking self-guided reading on leadership	3.78
17	Undertaking work-placement or exchanges	3.63
18	Participating in peer networks beyond the university	3.61
19	Involvement in professional leadership groups or associations	3.59
20	Completing a tertiary qualification relevant to leadership	3.50

6) Criterion for judging effective performance of academic leaders

Rank	Criterion for judging effective performance Academic Leaders	Average value
1	Producing significant improvements in learning and teaching quality	4.61
2	Delivering successful team projects in learning teaching	4.52
3	Producing future learning and teaching leaders	4.52
4	Receiving positive user feedback for your area of responsibility	4.51
5	Producing successful learning systems or infrastructure	4.48
6	Achieving goals set for your own professional development	4.48
7	Improving student satisfaction ratings for learning and teaching	4.46
8	Achieving a high profile for your area of responsibility	4.43
9	Establishing a collegial working environment	4.41
10	Delivering Agreed tasks or project on time and specification	4.39
11	Bringing Innovative policies and practices into action	4.39
12	Meeting student load targets	4.22
13	Achieving positive outcomes from external reviews of the area	4.20
14	Successful implementation of new initiatives	4.18
15	Having a high level of staff support	4.17
16	Promoting your team Achievements	4.05
17	Enhanced representation of equity groups	4.02
18	Winning resources for your area of responsibility	4.00
19	Publishing refereed papers and reports on learning and teaching	3.91
20	Increased student retention rate	3.91
21	Formative involvement of external stakeholders in your work	3.80
22	Being invited to present to key groups on learning and teaching	3.80
23	Winning learning and teaching awards and prizes	3.78
24	Securing competitive funds related to learning and teaching	3.65
25	Achieving a positive financial outcome for your area of responsibility	3.63
26	Achieving a positive financial outcome	3.41

Discussion

Establishing a competency-based model for the ALD program at COM-J will follow Kern's six-step approach: problem identification, general needs assessment, targeted needs assessment, goals and objectives, program strategies, implementation and evaluation. This study constitutes the general needs assessment step of the project.

The model adopted in this program has been validated in large-scale studies not only in Australia but also in Canada, the United Kingdom and South Africa, where international review workshops were conducted. The face validity and reliability were assessed and calculated, and high levels were found.

Leaders must be able to manage their own emotional reactions, and this ability reflects their personal capability. It is also important to have a high level of interpersonal capability to better understand what is occurring and to determine what might work best to resolve the situation.

Both personal and interpersonal capabilities have been extensively researched during the past decade by researchers such as Goleman (11) and are often referred to as a leader's "emotional intelligence." The results of this study showed a strong perception of the importance of different capabilities for effective performance for all academic leaders at COM-J. This outcome provides an important form of contextualization of the model for COM-J.

Effective leadership does not merely involve capability. Leading organizations such as COM-J also require both generic and specific knowledge and skills - the bottom circles in Figure 2. These areas of competency provide support for diagnosing different situations and are also a source for shaping and delivering the appropriate response. Therefore, all five domains must function in an integrated and productive manner over time. Thus, a

weakness in one area affects the operation of other areas. The contribution of this study is to help academic leaders to develop skills that are important for the effectiveness of academic leadership. Evidence from the 47 leaders who participated in this study affirms that effective leadership involves both individual talent and a situated capacity for implementation. Clearly, professional learning is not essential for leadership - many leaders have little formal training in leadership prior to assuming their roles, although they perform well. However, leadership training is a helpful and undoubtedly valuable means of ensuring high-quality leadership.

Unless academic leadership development programs are implemented properly with the appropriate approaches, they will fail. Therefore, to ensure that our ALD program will utilize the appropriate approaches for implementation, the 47 academic leaders completing the online survey were asked to rate the effectiveness of each of the learning approaches in assisting their development as an academic leader. If we compare the results of this study with those of Scott (10) and Coates (12). The table below shows that learning on the job and the study of real-life workplace problems were within the first five rankings in all the studies.

Although ad hoc conversations about work with people in similar roles, participation in peer networks within the university and involvement in informal mentoring/coaching were not within the first five ranks of preferred approaches at COM-J, the results still indicate the need for this program, as the environment is currently not supporting such approaches.

Establishing a competency-based model for the ALD program at COM-J will follow Kern's six-step approach: problem identification, general needs assessment, targeted needs assessment, goals and objectives, program strategies, implementation and evaluation. This study constitutes the general needs assessment step of the project.

Ranks	Scott et al. (2008)	The Current Study	Coates et al., (2010)
Learning on the job	1st	3rd	1st
Ad hoc conversations about work with people in similar roles	2nd	11th	3rd
Participating in peer networks within the university	3rd	18th	6th
Being involved in informal mentoring/coaching	4th	14th	5th
Study of real-life workplace problems	5th	5th	2nd

Limitations of the study

1. We limited the definition of academic roles to those who are positioned as formal leaders, but there are likely to be others who are engaged in informal leadership positions. Although this definition is behind the scope of this study, there would be value in further work to review the nature and effects of informal leadership at COM-J.
2. This study for the contextualization of the model to COM-J employed a quantitative approach; thus, qualitative studies are needed.

Conclusion

The study conducted within this project indicates that effective performance as an academic leader at COM-J, requires the combination of emotional intelligence (both personal and interpersonal), cognitive capabilities and a particular set of relevant skills and knowledge. This result serves to confirm the conceptual model summarized in Figure 2. The results are also consistent with those of parallel studies that have used the same framework (10).

Recommendations

1. The ALD program should be aligned with the findings of this study with regard to what and how academic leaders prefer to learn.
2. Further qualitative studies using semi-structured interview or focus groups for the same population with Scott, Coates and Anderson's (10) conceptual model for higher education leadership capability as a guide are required to improve our understanding and to gain a rich picture of leadership at COM-J.
3. The final capability/competency model resulting from further qualitative studies can be integrated with other human resource practices to create the following:
 - i. Hiring guidelines
 - ii. Job descriptions
 - iii. Promotion criteria
 - iv. Performance appraisal

References

- 1) Day D. V., & Harrison, M. M. A multilevel, identity-based approach to leadership development. *Human Resource Management Review*, 17(4), 360-373.2007
- 2) Ramsden, P., Prosser, M., Trigwell, K., & Martin, E. University teachers' experiences of academic leadership and their approaches to teaching. *Learning and Instruction*, 17(2), 140- 155. 2007
- 3) Academic leadership center. Ministry of Higher Education, Saudi Arabia. Retrieved from <http://www.alc.edu.sa>. 2013
- 4) Middlehurst, R., Goreham, H., & Woodfield, S. Why Research Leadership in Higher Education? Exploring Contributions from the UK's Leadership Foundation for Higher Education. *Leadership*, 5(3), 311-329 . 2009
- 5) Bryman, A. *Effective Leadership In Higher Education*. London: Leadership Foundation for Higher Education. 2009
- 6) Bolden, R., Petrov, G., & Gosling, J. Distributed Leadership in Higher Education: Rhetoric and Reality. *Educational Management Administration Leadership*, 37(2), 257-277. 2009
- 7) Gmelch, W. H. The department chair's balancing acts. *New Directions for Higher Education* 126, 16.2004
- 8) Thi Lan Huong Nguyen (2012): Identifying the training needs of Heads of Department in a newly established university in Vietnam, *Journal of Higher Education Policy and Management*, 34:3, 309-321
- 9) Spendlove, M. (2007), Competencies for effective leadership in higher education. *International Journal of Educational Management*, 21(5), 407-417
- 10) Scott, G., Coates, H., & Anderson, M. (2008). *Learning leaders in times of change: Academic leadership capabilities for Australian higher education*.
- 11) Goleman, D. (1999). *Working with Emotional Intelligence*. Bloomsbury Publishing.
- 12) Coates, Hamish Bennett; Meek, V Lynn; Brown, Justin; Friedman, Tim; Noonan, Peter; and Mitchell, John, "VET Leadership for the Future: contexts, characteristics and capabilities" (2010). http://research.acer.edu.au/higher_education/13
- 13) Anderson & Johnson, (2006), *Ideas of leadership underpinning proposals to the Carrick Institute: A review of proposals from the 'Leadership for Excellence in Teaching and Learning Program'*

A new method in the management of wrist ganglion (Silk thread passed through the ganglion); in comparison with other traditional methods

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Abstract

Objectives: To compare a new method of ganglion management, efficacy of resolution, frequency of complications and recurrence of managing dorsal wrist ganglions with aspiration followed by intracystic injection of Methylprednisolone and surgical excision and our new procedure Silk thread passed through the ganglion.

Study Design : A prospective descriptive study.

Place and Duration of Study: This is a prospective study conducted at the Department of Surgery Erbil Teaching Hospital-Erbil, Kurdistan Region of Iraq from April 2005 to June 2014.

Patients and Methods: A total of 785 patients were included in this study, 120 cases were excluded from the study because they were lost to follow-up. All patients were thoroughly examined to exclude the other causes of wrist swelling. The patients were divided into three groups A, B & C according to their choice of treatment. Group A were treated by surgical excision, Group B were treated by aspiration followed by steroid injection and group C by Silk thread passed through the ganglion. Baseline Data were recorded preoperatively and postoperative

data were obtained at the intervals of 2 weeks, 6 weeks, 3 months, and 6 months. At the end of 6 months the data form was completed and results analyzed.

Results: Patient's satisfaction was higher in Group C after Silk thread passed through the ganglion followed by surgical excision even if the ganglions recurred. The recurrence rate was 4 % in Silk thread passed and 24% surgical excision group and 43% in aspiration with steroid injection in group B.

Conclusion: In this study Silk thread passed through the ganglion had better results compared to surgical excision and to aspiration and injection of Methylprednisolone.

Key words: Dorsal, Wrist Ganglion, Silk thread passed through the ganglion, surgical excision, aspiration, Methylprednisolone injection.

Introduction

Ganglia are the most common benign soft tissue tumors of the hand. They represent 50% to 70% of all soft tissue tumors of the hand, and in some series, the percentage is even higher (1).

These soft murine-filled cysts are usually attached to the adjacent underlying joint capsule or tendon sheath (2).

The cyst expands in size and the fluid cannot flow freely back into the synovial cavity. Dorsal wrist represents 70% of all ganglion and volar wrist ganglion up to 20 %.(3)

Dorsal ganglion cyst originates from the scapholunate joint, often with direct attachment to the scapholunate interosseous ligament (ISLIL) (4).

The ganglions usually appear spontaneously without any particular cause; pain associated is dull aching pain and severity is not related to the size of ganglions. The diagnosis of the ordinary wrist ganglion should rarely be in doubt when the mass is in typical site and has the usual size, shape and consistency, though other serious entities may simulate wrist ganglion (5).

Different treatment modalities for wrist ganglions have been described in literature ranging from observation reassurance, digital pressure rupture with mallet, aspiration with or without different agents, subcutaneous tenotomy dissection and cross fixation with heavy sutures to orthoscopic resection and surgical excision (6).

Surgical excision of wrist ganglia has been reported to have the best success rates in terms of recurrence; for example Angelides and Wallace in 1976 reported a 99% success rate (7). However, the treatment is relatively expensive and can only be offered reliably in a specialist hand center. The complications associated with the treatment by surgical excision are recurrence, infection, wound healing, neuromas, joint stiffness and decreased grip strength. Aspiration and injection of steroid has higher recurrence rate, but other complications are much lower than that of surgical excision (8).

This prospective study was conducted to find out whether aspiration and injection of ganglion with Methylprednisolone was effective as surgical excision and Silk thread passed in a cross manner.

Patients and Methods

Seven hundred and eighty five patients were included from the outpatient department of surgery Erbil Teaching Hospital, Erbil, Kurdistan Region of Iraq from April 2005 to June 2014. All patients were thoroughly examined by the attending physician to exclude the other causes of dorsal wrist swelling. All 785 patients were informed about the three treatment modalities and they were divided into three groups A, B and C according to their options. Group

A comprised 163 patients treated by surgical excision and 155 formed Group B and were dealt with by aspiration and Methylprednisolone: 20-40 mg injections and 464 formed Group C dealt with Silk thread passed in a cross manner (Figure 1).

There was no sex or age limit. Those patients who were operated on or aspirated in the past were excluded from this study. Blood test including blood CP, ESR, RA factor and X-Rays wrist joint AP and Lateral view were performed in all cases.

In Group A surgical excision was performed under General Anaesthesia. Pneumatic tourniquet was applied in most cases. The incision used respected the skin creases and was long enough to give satisfactory exposure of the skin lesion. Attempt was made to exercise a generous capsular margin about its base and joint capsule was left open and cauterized. One shot of I.V 3rd generation Cephalosporin was given at time of induction followed by 3 doses of oral antibiotics postoperatively. Prior to wound closure tourniquet was released, hemostasis secured and the wound was closed with prolene. Patients were called for follow up on the 2nd week, 6th week, and 3,6 month; findings were documented. The patients in Group B and C were in OPD in supine position with wrist flexed on a towel. The area was prepared and draped.

Syringe (10ml) with 18 gauge needle was inserted in the center of the ganglion; gelatinous content was aspirated and demonstrated to the patient. Syringe was removed leaving needle in place. 1.5ml local anesthetic injection Xylocaine and 40 mg of methylprednisolone was injected. In group C, no.1 silk on cutting needle was inserted in the ganglion horizontally from side to side; a ring of silk created gelatinous content was evacuated by gentle digital pressure on the ganglion xylocaine lubricant was applied on the silk ring and the patient advised to rotate the silk ring and apply gentle digital pressure on the ganglion 3 times\day for 7 days .

Patients were asked to follow up at the OPD and 2 weeks, 6 weeks, and 6 months findings were documented and results were analyzed.

Technique of new in cross manner:

Under aseptic measures, a silk No.1 on a curved needle passed through the ganglion (Figure 1) and aspiration of the jelly like transparent material was performed by applying pressure on the ganglion with the thumb jelly material comes out at both sides of the needle puncture and silk fixed as a Ring. After complete evacuation a crepe bandaging was applied over the wrist (Figures 1, 2, 3, 4) On the second day after procedure the first dressing was removed and patients start to rotate the silk in both directions with applying local digital pressure and antibiotic ointment. Silk was removed on the 12th day. In this procedure no anesthesia was used during the procedure all patients were followed up every month for an initial 3 months and at 6 months interval for one year.

Figure 1: dorsal wrist ganglion classical site



Figure 2: Insertion of needle through the ganglion after application of topical anesthesia under aseptic condition



Figure 3: Farther advancement in the process of needle insertion creating a ring in the silk



Figure 4: The procedure has been completed



Results

Table 1: Resolution of pain at different intervals

Intervals	Group A n=123	Group B n=115	Group C n=427	P value
2 nd week	(62) 50 %	(63) 55 %	(342) 80%	P<00.1
6 th week	(76) 62 %	(77) 67 %	(362) 85%	P<00.1
3 rd month	(85) 69 %	(83) 73 %	(375) 88%	P<00.1
6 th month	(87) 71 %	(91) 79 %	(405) 95%	P<00.1
12 months	(102) 83 %	(100) 87 %	(418) 98%	P<00.1

Table 2: Wrist stiffness in both groups at different intervals

	Group A n=123	Group B n=115	Group c n=427	P value
3 rd month	(45) 37 %	(33) 33 %	30 07%	P<00.1
6 th month	(33) 27 %	(46) 40 %	21 05%	P<00.1
1 Year	(16) 13 %	(61) 53 %	8 02%	P<00.1

During the study period from April 2005 to June 2014, 785 patients with dorsal wrist ganglion were included in this study 532 patients were female and 253 were male. Patient's age ranged from 18-38 years, mean age was 25 years. In this study 120 patients were lost during follow up leaving 665 patients.

One hundred and twenty three patients in group A , 115 patients in group B and 427 in group C were available for follow up at 6 month. Complete resolution of pain in group A, B & group C at different follow up intervals are shown in Table 1.

Stiffness of wrist was observed in all 3 groups which improved at different intervals in group A. In group B stiffness increased in late follow up probably because of more recurrence and completely improved in the first month shown in Table 2. At the end of six month recurrence rate was 24% (29 patients) in group A as compared to group B where 43 % (49 patients) presented with recurrence while recurrence rate in group C was 4%(17) . There were four cases of superficial infection in group A which responded to antibiotics and dressing. There was one case of change in skin color in group B, and 8 cases with superficial infection in group C.

Discussion

A ganglion in a musculoskeletal system is spherical accumulation of fluid produced from an adjacent joint capsule or tendon sheath. It's not a neoplasm because it is a cellular, and it's not a cyst because the collection of clear viscous fluid is contained in the cavity, which is not lined by

epithelium(1). Dorsal wrist ganglion is the most common non-tumorous swelling of the wrist (2, 5, 6).

This prospective clinical trial compared the treatment of ganglion by either aspiration and steroid injection or surgical excision and Silk thread passed through the ganglion. Different treatment methods for wrist ganglion are reassurance, rupture, and aspiration with or without different agents, surgical excision and arthroscopic resection (7, 9). Explanation of the benign nature of ganglion and natural history that it may fluctuate in size over time can relieve the fear of malignancy (10). Results of different treatment methods reported literature are variable. There is general impression that Silk thread passed in through the ganglion offers excellent result comparing with open excision and aspiration with or without different agents, probably on the basis of Angelides and Wallace's (2006) study reporting 1 % recurrence rating (11) Clay and Clement (2008) have also shown low recurrence rate of 3 % (12), while other studies reported higher recurrence rate (7, 13).

Regarding open excision, McEvedy (1999) reported 40 % recurrence rate (14), Jacobs and Govaers (2006) reported 28 % and Dias et al (2007) 39 % recurrence rate (3, 15). We had a recurrence rate of 24 % in our study. The variability in results to some extent seems to be surgeons dependent. Recurrence rate after aspiration and injection of different agents are higher and least with Silk thread passed through the ganglion. Gerhard et al reported 85 % recurrence rate after hyaluronidase injection aspiration. McEvedy (1999) reported 80 % recurrence rate after sclerosant (14). Derbyshire (1966) reported 60-85% recurrence rate after aspiration and injection of steroid

(16). We have low recurrence of 43 % after aspiration and injection of methylprednisolone compared to other studies. Arthroscopic resection of ganglion of wrist originally described by Osterman and Raphael (1995) is technically difficult and demanding (17). Different series of arthroscopic resection wrist ganglion have shown promising results. We did not have any significant complication.

Reviewing the literature and with our results it seems Silk thread passed through the ganglion has better results in comparison with other methods of treatment and is an acceptable option in our setup.

Conclusion

In this study we have concluded that recurrence rate, postoperative joint stiffness and pain resolution was least in a new method technique comparing with other classical surgical and non-surgical groups. Further studies with more patients are needed to elucidate the clinical impact of Silk thread passed in cross manner in the management of wrist ganglion.

References

- 1- Burke FD, Melikyan EY, Bradley MJ, Dias JJ. Primary care referral protocol for wrist ganglia. *Postgraduate Medical Journal* 2003; 79(932): 329-331.
- 2-Dias J, Buch K. Palmar wrist ganglion: does intervention improve outcome? A prospective study of the natural history and patient-reported treatment outcomes. *Journal of Hand Surgery* 2003; 28(2): 172-176.
- 3-Dias JJ, Dhukaram V, Kumar P. The natural history of untreated dorsal wrist ganglia and patient reported outcome 6 years after intervention. *Journal of Hand Surgery* 2007; 32E(5): 502-508.
- 4-Limpaphayom N, Wilairatana V. Randomized controlled trial between surgery and aspiration combined with ethylprednisolone acetate injection plus wrist immobilization in the treatment of dorsal carpal ganglion. *Journal of the Medical Association of Thailand* 2004; 87(12): 1513-1517.
- 5-Lowden CM, Attiah M, Garvin G, Macdermid JC, Osman S, Faber KJ. The prevalence of wrist ganglia in an asymptomatic population: magnetic resonance evaluation. *The Journal of Hand Surgery* 2005; 30(3): 302-306.
- 6-Tallia AF, Cardone DA. Diagnostic and therapeutic injection of the wrist and hand region. *American Family Physician* 2003; 67(4): 745-750.
- 7-Thommasen HV, Johnston CS, Thommasen A. Management of the occasional wrist ganglion. *Canadian Journal of Rural Medicine* 2006; 1(1): 51-52.
- 8-Gundes H, Cirpici Y, Saelak, Muezzinoglu S. Prognosis of wrist ganglion operations. *Acta Orthopaedica Belgica* 2000; 66(4): 363-367.
- 9-Mathoulin C, Hoyos A, Pelaez J. Arthroscopic resection of wrist ganglia. *Hand Surgery* 2004; 9(2): 159-164.
- 10- Povlsen B, Tavakkolizadeh A. Outcome of surgery in patients with painful dorsal wrist ganglia. *Hand Surgery* 2004; 9(2): 171-173.
- 11- Angelides AC, Wallace's PF. The dorsal ganglion of the wrist. its pathogenesis, gross and microscopic anatomy, and surgical treatment. *JHand Surgery* .2006;1;228235.
- 12- Clay NR, Clement DA, The treatment of dorsal wrist ganglion by radical excision; *JHand Surg* 2008;13;187-91.
- 13- Singhal R, Angmo N, Gupta S, Kumar V, Mehtani A.. Ganglion cysts of the wrist: A prospective study of a simple outpatient management. *Acta Orthopaedica Belgica* 2005; 71(5): 528-534.
- 14- McEvedy BV, The simple ganglion :A review of modes of treatment and an explanation of the frequent failures of surgery; *LANCET* 1999;16;266;1356
- 15- Jacob LG, Govaers KJ, The volar wrist ganglion :Just a simple cyst? *JHand Surg* 2006;11;21-6.
- 16- Derbyshire RC, Observation on the treatment of ganglion ,with a report on methylprednisolone *AM J SURG* 1966 ;112,635-6.
- 17- Osterman AL, Raphael J. Arthroscopic resection of dorsal ganglion of the wrist. *Hand Clin.* 1995 Feb;11(1):7-12.

Seroprevalence of Measles, Rubella, Mumps and Varicella Specific Antibodies in Primary School Children

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Abstract

Measles, mumps, rubella and varicella are diseases that are tracked by the World Health Organization (WHO) as common and serious vaccine-preventable diseases.

Aim of the Work: To evaluate the immune status and susceptibility against measles, mumps, rubella, and varicella in primary school children and to study the effects of some sociodemographic factors on the seroprevalence.

Subjects and methods: This is a cross-sectional study conducted on 180 children. All children included in this study were subjected to thorough history taking and laboratory investigations; to measure serum levels of specific measles, rubella, mumps and varicella immunoglobulins (IgG)

Results: (88.9%) of the surveyed children were seropositive to measles, (77.8%) to mumps, (86.7%) to rubella and (38.9%) to varicella. Seropositivity was higher in males than in females for measles (57.7%), mumps (60.7%), rubella (62.2%) and varicella (68.6%) with significant difference for measles. Younger age groups were less seropositive

than older age groups for measles (32.5% vs 35%), mumps (34.4 % vs 37.9%), rubella (30.8 % vs 39.7 %) and for varicella (21.4%) vs 48.6%). The highest level of seronegativity was seen with regard to varicella specific antibodies (61.1%).

Conclusion and recommendations: There is an urgent need for a planned program with different strategies to prevent and control these diseases .

Key words: Seroprevalence, measles, mumps, rubella, varicella, primary school children, Egypt

Introduction

Measles is a highly contagious viral disease. Typical symptoms are high fever, cough, coryza, conjunctivitis and maculopapular rash. Common complications include otitis media, Post-infectious encephalitis in about 0.1% of reported cases, and subacute sclerosing panencephalitis in about 1/10,000–100,000 cases.

Rubella is a viral disease presenting with fever, rash and lymphadenopathy. Its importance is caused by its teratogenic effect on the fetus causing miscarriage, fetal death and congenital rubella syndrome(2).

Mumps is a vaccine preventable viral infection. Its typical clinical manifestations are pain and swelling of the salivary glands, fever, and fatigue. Other organs are commonly affected (orchitis, oophoritis, pancreatitis, meningitis) (3).

Varicella-zoster virus (VZV) is the etiologic agent of varicella (primary infection) and herpes zoster (reactivation of latent infection). Although varicella is most often a relatively benign and self-limited childhood illness, the disease may be associated with a variety of serious and potentially lethal complications in both immunocompetent and immunocompromised persons (4).

The measles, mumps and rubella (MMR) vaccine is a mixture of measles, mumps and rubella live attenuated viruses, administered via SC injection. The shot is generally administered to children around the age of one year. The WHO recommends that in order to eliminate congenital rubella syndrome and to prevent the complications associated with mumps and measles, countries should use the measles, mumps and rubella (MMR) vaccine in a two-dose schedule for routine childhood immunization programs (5).

In 2002, Egypt established a goal of measles elimination by 2010 using the WHO/UNICEF Comprehensive Strategy for Sustainable Measles Mortality Reduction (6) and also set a goal of rubella elimination and congenital rubella syndrome (CRS) prevention by 2010. The strategy for rubella elimination included the introduction of MMR as the second dose of measles-containing vaccine(MCV) in 1999. In 2008, the immunization schedule was updated to use MMR for both doses of MCV and to administer the first dose at 12 months of age and the second dose at 18 months of age (7).

A two dose program with varicella vaccination is also likely to be required for elimination of childhood varicella and has been recently recommended in the United States(8).

The measles, mumps, rubella, and varicella (MMRV) vaccine was licensed in 2005 for use among children aged 12 months up to 12 years. It is a single shot that can be used in place of two other vaccines administered in two separate shots-the measles, mumps, rubella (MMR) vaccine and the varicella vaccine for chickenpox(9).

In Egypt, there is limited data about the serological status of school children for these infectious diseases. Monitoring school childrens' seroprevalence and understanding the immune status of children remains important to potentially identify those with higher susceptibility and guide national immunization policies to modify a routinely administered schedule or implement a new schedule.

Aim of the Work

To evaluate the immune status and susceptibility of a sample of primary school children against measles, mumps, rubella, and varicella in Egypt by conducting a seroprevalence survey utilizing an enzyme immunoassay and to study the effects of some sociodemographic factors on the seroprevalence.

Subjects and Methods

This is a cross-sectional study conducted at Meat-Mousa village school, Menoufia Governorate, Egypt in the period from June 2013 up to February 2014. Cluster sampling technique was used. One class was randomly selected from each educational grade. It was conducted on 180 children; their ages ranged from 6 to 12 years. They were 109 males and 71 females. Parents of participants were asked to fill out an especially designed questionnaire.

The studied children were subdivided into the following groups according to their ages:

- Group I 6 -8 years (n=60)
- Group II >8-10years (n=56)
- Group III >10-12 years (n=64)

Inclusion Criteria:

Apparently healthy Children aged 6-12 years.

Exclusion Criteria:

Acute illness; fever more than 38 degrees centigrade, recent administration of immunoglobulins, blood product or immunosuppressive therapy and suspected or confirmed immune suppressive conditions.

The study was conducted according to the rules of Benha Faculty of Medicine ethical committee. A written consent from all student parents was taken with explanation of the purpose of the study and ensuring privacy.

All children included in this study were subjected to the following:

1-Thorough history taking:

• Full medical history including:

- Full personal and social history e.g.: age, sex, residence, order of birth.
- Nutritional history: feeding, breast fed or bottle fed.
- Developmental history: motor and mental development.
- Vaccination history especially MMR timing and number of doses.
- Contact to measles, rubella, mumps and varicella cases or catch up the diseases.

• Parents history including:

- Mother and father's occupation and educational degree
- Socioeconomic status according to the following score(10)

The total score was

Scores from 19-25	High social standard
Scores from 12-18	Moderate social standard
Scores from 6-11	Low social standard
Scores of < 6	Very low social standard

2- Thorough clinical examination:

-Anthropometric measures include: weight, height and body mass index.

- Chest, cardiac and abdominal examination.

3-Laboratory investigations:

About 3ml of peripheral blood was withdrawn from each child into a sterile vacutainer and allowed to clot. After centrifugation the obtained sera were aliquoted and kept frozen at - 20°C till further processing. The serum

samples were used, according to the instructions of the manufacturers for:

1- Measurement of serum levels of specific Measles IgG using KAPRMVG10 Measles IgG ELISA kit -DIA source, Belgium (11).

2- Mumps, and varicella specific IgG were done for all children using ELISA kits (The KAPRMUG12 Mumps IgG ELISA kit -DIA source-Belgium and KAPRVIG20 Varicella zoster IgG ELISA kit - DIA source-Belgium (12).

3- Measurement of serum levels of specific Rubella IgG using RB025G Rubella IgG ELISA kit -Calbiotech-Spring Vally)(13).

The Cut-Off was calculated. The sample was considered:

Positive:	If the ratio was > 1.1.
Doubtful:	If +/- 10% of the Cut-Off.
Negative:	If the ratio was < 0.9.

If the result was doubtful, the test was repeated. If it was still doubtful, a new serum sample was collected.

Results

Table 1: Seroprevalence status of measles antibodies by sociodemographic factors

Measles IgG Variable		Seropositivity		Seronegativity		
		No	%	No	%	
Gender	Female (n.=71)	68	42.5	3	15	≤ 0.05
	Male (n.=109)	92	57.5	17	85	
Age	6-8y	52	32.5	8	40	>0.05
	>8-10	52	32.5	4	20	
	>10-12	56	35	8	40	
Breast feeding	Yes	159	99.4	20	100	>0.05
	NO	1	0.6	0	0	
Social Standard	High	76	47.5	8	40	>0.05
	Middle	46	28.8	8	40	
	Low	38	23.8	4	20	
Previous Infection	No	156	97.5	20	100	>0.05
	Unknown	4	2.5	0	0	
Total		160	100	20	100	

Table 2: Seroprevalence status of mumps antibodies by sociodemographic factors

Mumps IgG Variable		Seropositivity		Seronegativity		P value
		No	%	No	%	
Gender	Female (n.=71)	55	39.3	16	40	> 0.05
	Male (n.=109)	85	60.7	24	60	
Age	6-8y	48	34.4	12	30	≤0.05
	>8-10	39	27.9	17	42.5	
	>10-12	53	37.9	11	27.5	
Breast feeding	Yes	139	99.3	40	100	>0.05
	NO	1	0.7	0	0	
Social Standard	High	70	50	14	35	>0.05
	Middle	38	27.1	16	40	
	Low	32	22.9	10	25	
Previous Infection	Yes	11	7.9	0	0	>0.05
	No	123	87.9	39	97.5	
	Unknown	6	4.3	1	2.5	
Total		140	100	40	100	

Statistical analysis : the collected data were tabulated and analyzed using (SPSS version 16) software (SPSS Inc., Chicago, ILL Company) .

Chi-square and Fisher's exact are statistical tests used in analysis

The accepted level of significance will be (P ≤0.05)

Table 3: Seroprevalence status of rubella antibodies by sociodemographic factors

Rubella IgG Variable		Seropositivity		Seronegativity		P value
		No	%	No	%	
Gender	Female (n.=71)	59	37.8	12	50	> 0.05
	Male (n.=109)	97	62.2	12	50	
Age	6-8y	48	30.8	12	50	≤0.05
	>8-10	46	29.5	10	41.7	
	>10-12	62	39.7	2	8.3	
Breast feeding	Yes	155	99.4	24	100	>0.05
	NO	1	0.6	0	0	
Social Standard	High	76	47.4	10	41.7	>0.05
	Middle	44	28.2	10	41.7	
	Low	38	24.4	4	16.7	
Previous Infection	No	156	97.4	24	100	>0.05
	Unknown	4	2.6	0	0	
Total		156	100	24	100	

Table 4: Seroprevalence status of varicella antibodies by sociodemographic factors

Varicella IgG VARIABLE		Seropositivity		Seronegativity		P value
		No	%	No	%	
Gender	Female (n.=71)	22	31.4	49	44.5	> 0.05
	Male (n.=109)	48	68.6	61	55.5	
Age	6-8y	15	21.4	45	40.9	≤0.05
	>8-10	21	30	35	31.8	
	>10-12	34	48.6	30	27.3	
Breast feeding	Yes	69	98.6	110	100	>0.05
	NO	1	1.4	0	0	
Social Standard	High	36	51.4	48	43.6	>0.05
	Middle	19	27.1	35	31.8	
	Low	15	21.5	27	25.2	
Previous Infection	Yes	12	17.1	1	0.9	>0.05
	NO	58	82.9	106	96.4	
	Unknown	0	0	3	2.7	
Total		70	100	110	100	

A total of 180 children were surveyed . There were (60.6%) males and (39.4%) females. The age ranged from 6 up to 12years and distributed as 33.3% for 6-8 age group, 31.1% for > 8 -10 age group and 35.6% % for >10- 12 age group. Only 18.3% of the studied children of age group (6-8 yrs) received the MMR vaccine first dose (at 12 months) while all of the other 2 groups (>8-10 yrs and >10-12 yrs) didn't receive the first dose of the vaccine at 12 month. Regarding the second dose of the vaccine (at 18 months) all age groups received the vaccine.

There is increasing titre of measles, mumps and rubella IgG with increasing age with no statistical significant difference but there is a statistically significant decreasing varicella titre with increasing age. (Figure 1).

There is increasing titre of measles ,mumps and varicella among low social class while rubella titre reported higher figures among high social class. Figure (2)

Regarding seroprevalence of virus antibodies of the children tested 160 (88.9%) were seropositive to measles, 140 (77.8%) to mumps, 156 (86.7%) to rubella and 70 (38.9%) to varicella. Seropositivity was higher in male than in female children for measles (57.7%), mumps (60.7%), rubella (62.2%) and varicella (68.6%).

No significant difference was found between male and female with regard to seropositivity to, mumps, rubella and varicella; however, males were significantly more seropositive to measles than females

Analysis of the data according to age reveals that there were significant differences in seropositivity rates in age groups for mumps , rubella and varicella. Younger age groups were less seropositive than older age groups for measles (32.5% vs 35%), mumps (34.4% vs 37.9%), rubella (30.8% vs 39.7%) and for varicella (21.4% vs 48.6%) with statistically significant differences except for measles.

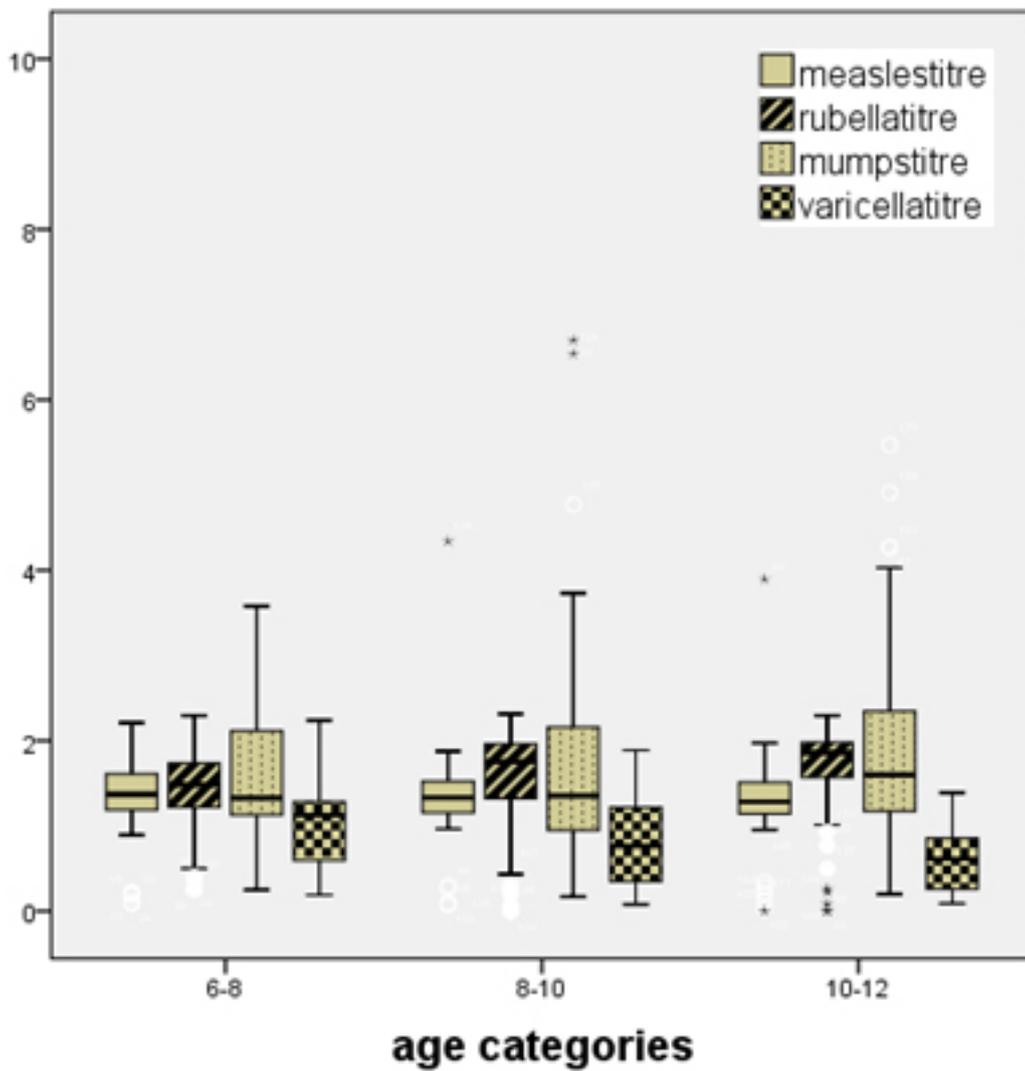


Figure 1: Distribution of titres between different age groups

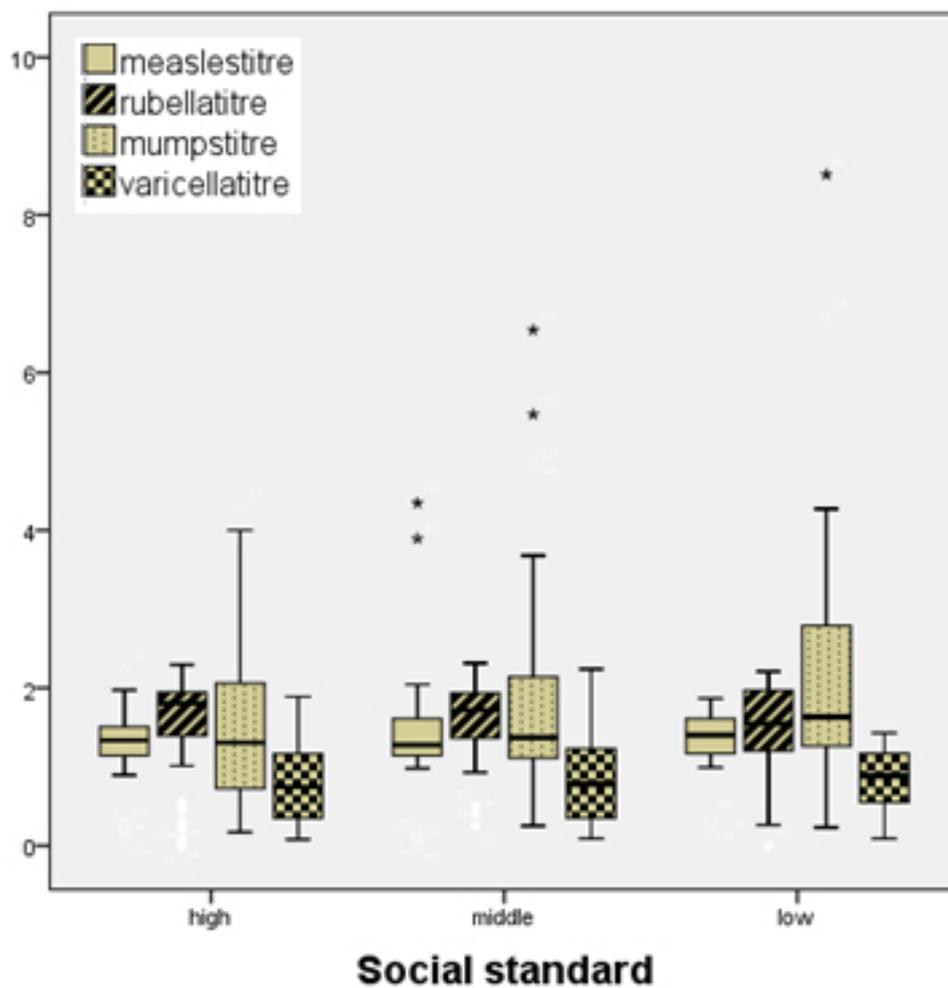


Figure 2: Distribution of titres between different social classes

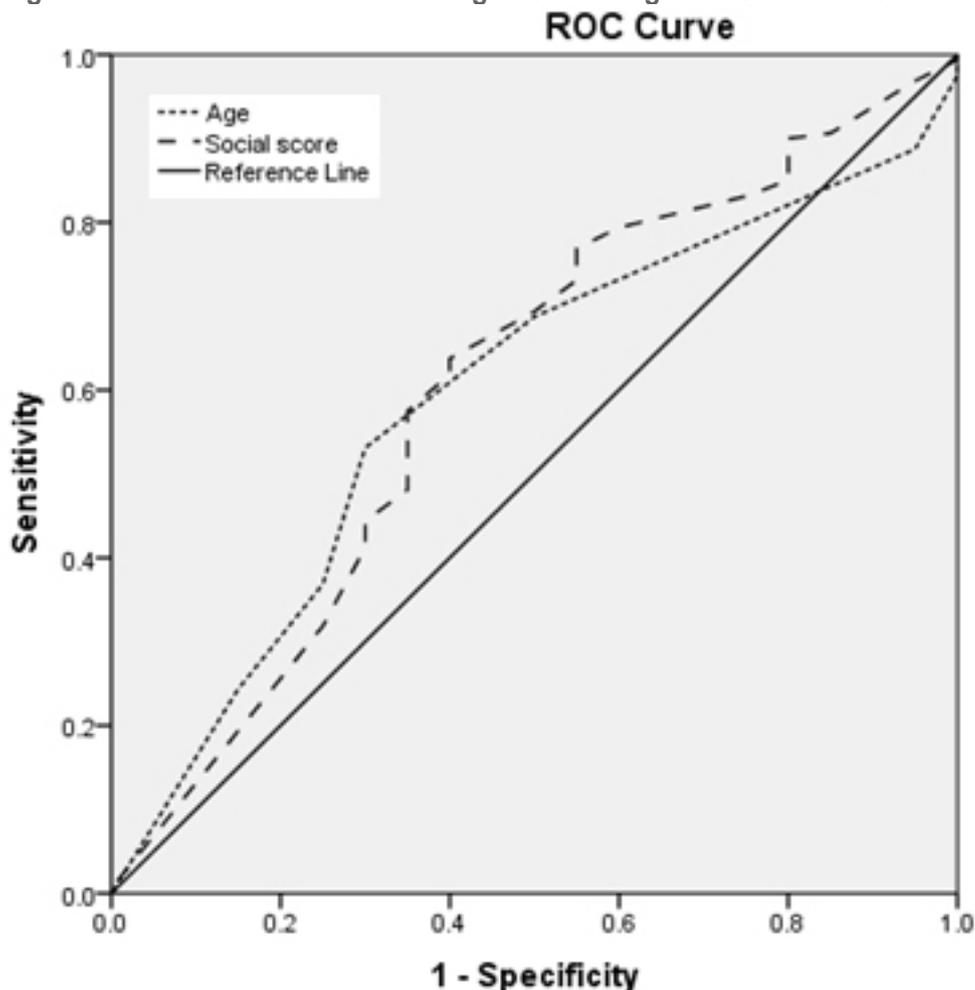
The majority of the surveyed children were normally breast fed (99.4%) with no significant higher seropositivity rates among them for measles (99.4%), mumps (99.3%), rubella (99.4%) and varicella (98.6%).

Overall, the highest level of seronegativity was seen with regard to varicella specific antibodies (61.1%). Some differences for gender and age were seen; In general, girls had a lower rate of seronegativity for measles (15%), mumps (40%) and varicella (49%) but this pattern was not seen in rubella (50%). Generally, seronegativity was highest in the age group 6-8 year old children for measles (40%), rubella (50%), and varicella (45%) but for mumps it is highest among 8-10 age group (42.5%).

Higher seropositivity of measles (47.5%), mumps (50%), rubella (47.4%) and varicella (51.5%) IgG were observed in high social class compared to middle and low social classes but with no statistical significant differences.

High percentage (97.5%, 87.9%, 97.4% and 82.9%) of seropositivity of the studied group was in children without past history of infection regarding measles, mumps, rubella and varicella IgG respectively with no significant statistical results.

Figure 3: Relation between measles IgG titre and age and social class



Figures (3,4,5,6,): Regarding age: Area under the curve is : less than 0.6 for rubella and mumps (i.e., age is a worthless predictor for sero- prevalence of rubella and mumps), nearly 0.6 for measles, larger than 0.6 for varicella (i.e., age is a fair predictor for seroprevalence of measles and varicella) with statistically significant results for rubella and varicella.

Figures (3,4,5,6) Regarding social class : Area under the curve is: equal to 0.6 for measles (i.e., social score is a fair predictor for sero- prevalence of measles), less than 0.6 for rubella, mumps and varicella (i.e., Social score is a worthless predictor for seroprevalence of rubella mumps and varicella) with non statistically significant results.

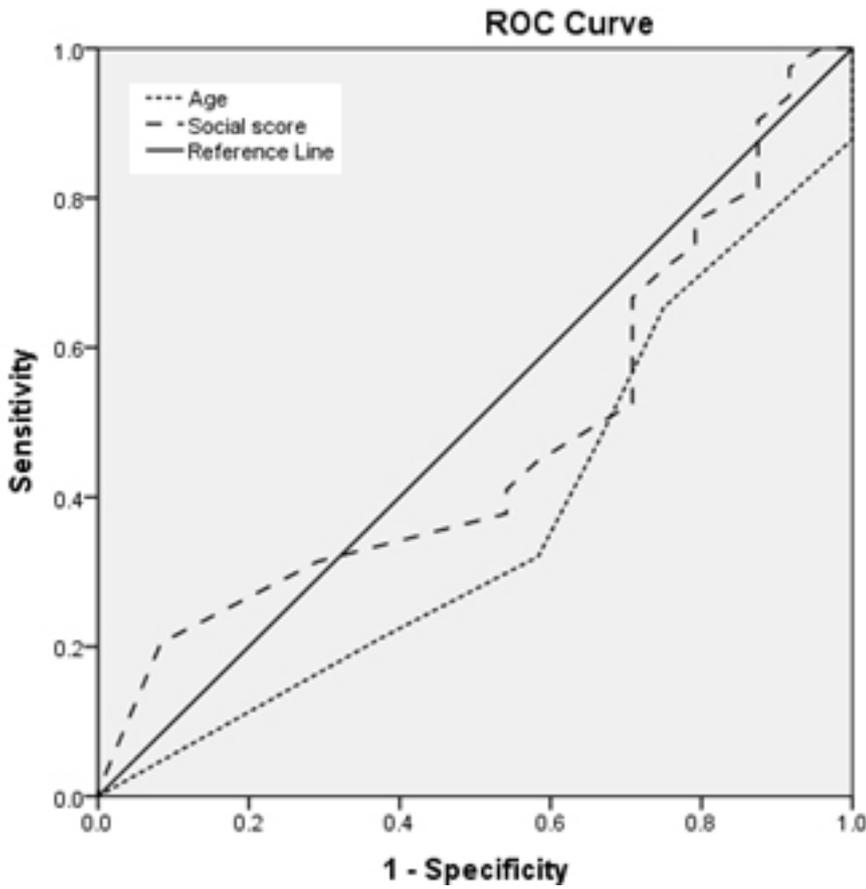


Figure 4 : Relation between rubella IgG titre and age and social class

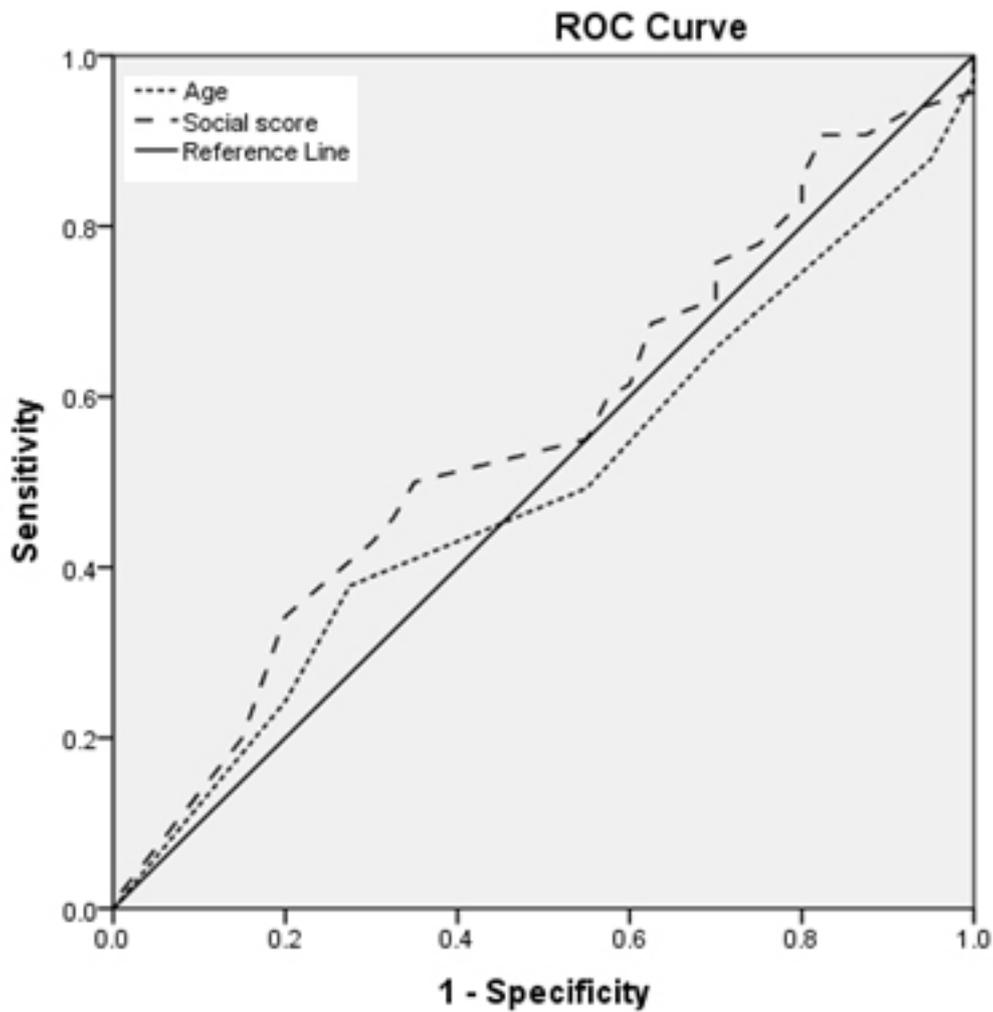
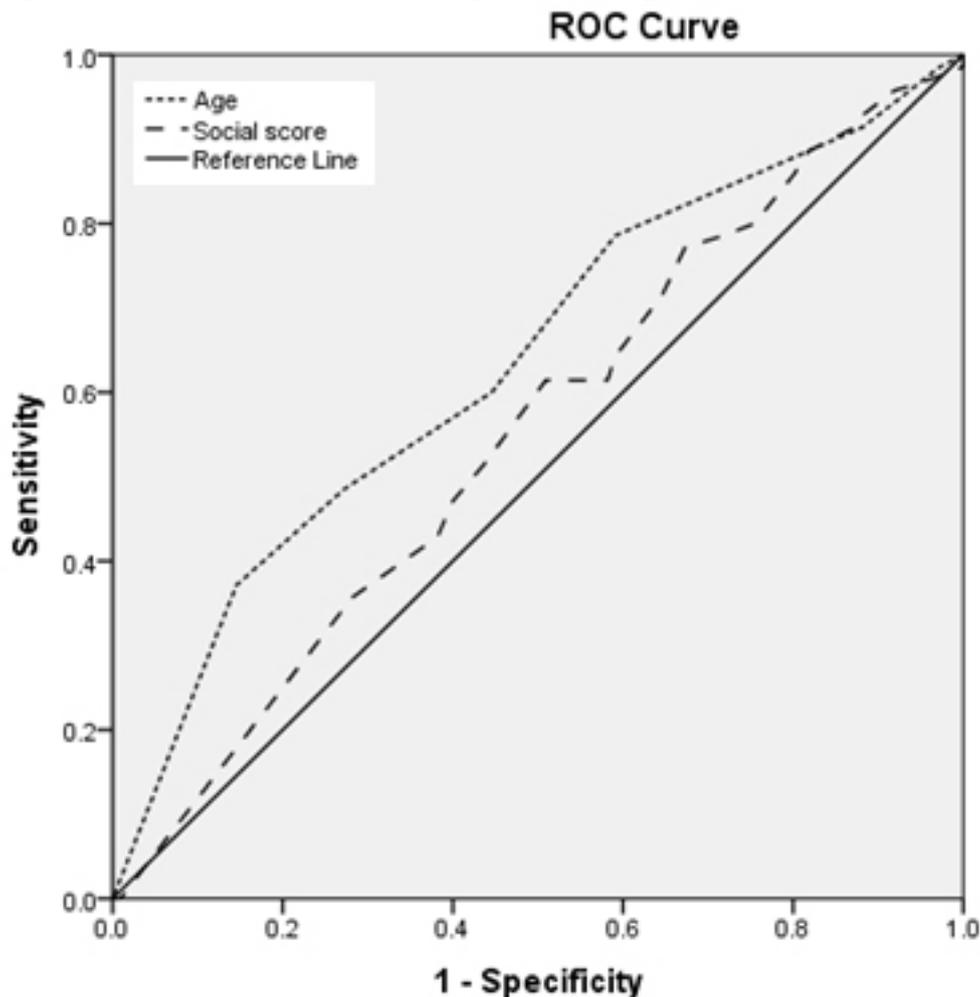


Figure 5: Relation between mumps IgG titre and age and social class

Figure 6: Relation between varicella IgG titre and age and social class



Discussion

Measles, mumps, rubella and varicella are diseases that are tracked by the World Health Organization (WHO) as common and serious vaccine-preventable diseases i.e ; licensed vaccines are available to prevent, or contribute to the prevention and control of them. Immunization is one of the safest, most cost-effective means of preventing diseases. Nowadays, all countries of the world have incorporated a broad immunization program in their public health interventions.

Our study showed that 88.8 % of the studied group was seropositive for measles IgG and 86.6% was seropositive for rubella IgG. These results were in agreement with different studies ; in Egypt and Pakistan, 86.1% and 79.9% respectively of the studied group was seropositive for measles IgG (14,15). In Germany seropositivity was 89.5% for measles and 86.25% for rubella (16) In Thailand and Iran 93.4% and 85% respectively were seropositive for rubella (17, 18).

This study revealed that 77.8%. were seropositive for mumps IgG. Different figures have been reported world wide ; in the United States 88% positivity for two doses(19,20) and overall 94% positivity were reported in another study (21) and in Bulgaria 79% were positive(3).

This study reported that the percentage of seropositivity of varicella IgG was only 38.9%. In contrary to our results a higher rate was reported in other studies; in Bangladesh seropositivity is approximately 65% (22), In Australia; 83% by the ages of 10-14 years (23) and in Turkey and Italy, levels of immunity by the ages of 10-14 years were 85% and 82 % respectively(24, 25).

Differences between countries are likely to be related to climatic conditions and mixing patterns, particularly in relation to child day care (23) or difference in vaccination program coverage. There are some differences between regional seropositivity rates which are perhaps attributable to differences in the design of early childhood immunization programmes of each country.

This study shows that seropositivity was higher in male than in female children for measles (57.7%), mumps (60.7%), rubella (62.2%) and varicella (68.6%) with no significant results except for measles.

For measles this was in agreement with many studies in Pakistan (15) and in Korea (26) but it was in contrast with others (14, 16, 27).

For rubella this was in contrast with others in Germany (16) in Japan (27) and in Colombia (28).

Regarding mumps, our results coincide with a German study which revealed that boys were more likely to be seronegative to measles, mumps and rubella than girls (16).

On the other hand a study conducted on Bulgarian children revealed a significantly higher prevalence of mumps antibodies in girls(29).

Measles was endemic in Egypt until 2008. During the 1980s, large measles epidemics occurred every 2-4 years. Similarly, outbreaks in the 1990s continued to occur every 2-4 years. Between 1996 and 2000, the majority (>80%) of measles cases were reported in persons aged >10 years (30).

Since 2000, there has been a remarkable decrease in the number of reported cases of measles. This decrease has occurred among age-groups targeted by the mass vaccination campaigns conducted during 2000-2004 as a part of the measles elimination strategy.

In 2006, however, the number of confirmed measles cases increased dramatically to 953 . In 2006, the age distribution of cases was as follows: 22% aged 1-5 years, 56% aged 6-15 years, and 10% aged 16-20 years (7).

In 2008, reported measles cases decreased to 771 with a similar age distribution . In 2008 and 2009 a 2-phase measles, rubella (MR) campaign was conducted and had a significant impact on measles cases(2).

Rubella surveillance was part of communicable diseases surveillance in Egypt and had been in place for many years (7).

In 2002 and 2003, 274 and 261 confirmed rubella cases were reported, respectively, of which many (>45%) occurred among children 5-9 years of age. In 2005 up to 2007, a nationwide epidemic began; most rubella cases were reported among persons 11-20 years old. In 2008, the epidemic waned. Following the 2008-2009 MR vaccination campaign, only a few cases of rubella were reported (2).

Also in a recent study in Egypt the overall measles antibody seropositivity was 88% and rubella antibody seropositivity was 74%. Measles antibody seropositivity averaged 87% in 1- to 4-year old children and increased to an average of 93% in children aged 10-20 years. Rubella antibody seropositivity averaged 56% (range: 43-71%) in children aged 1-4 years and gradually increased to an average of 91% in adolescents and young adults aged 15-19 years old (6).

This coincides with the results of this study which reveals that younger age groups were less seropositive than older age groups with significant differences in seropositivity rates in age groups for mumps , rubella and varicella. The increasing prevalence of antibodies in the older children may be due to either vaccination schedule or exposure to natural infection/ mature immune systems.

Regarding measles, this was in agreement with others (14, 15) but in contrast with another study in Germany (16) which reported a higher percentage in 7-10 age groups than in 11-13 years old.

Also the increasing measles antibody level by age was supported by many researchers; in Korean children (26), in Italian children (31), WHO Report (32) and in Australian children (33,15).

Regarding rubella, this was in agreement with Tharmaphornpilas (2009) study in Thailand (17), but in contrast with others (16).

In our study, age of children had a significant effect on the seropositivity of mumps titre. Age was reported as a significant factor by many studies. In a Bangladeshi population mumps antibody had shown a steep rise from age 2 to 3 years up to 14-15 years age (34). On the other hand, in another study on Finnish children there were declining mumps antibody levels and rising negativity rates (35).

In this study, varicella seronegativity decreased significantly with age of the studied children group. This coincides with a seroepidemiologic survey in Catalonia (Spain) which reported decreased susceptibility to VZV by increasing age (36) but disagrees with other studies in Canada (37) and in Sri Lanka (38). Also a study conducted in Saudi Arabia revealed a non significant difference between age groups in the prevalence of immunity to varicella (39).

Regarding the type of feeding, our study showed that breast feeding has no significant effect on measles , mumps or rubella IgG. The same results were obtained by others (40, 41).

According to the socioeconomic state, higher seropositivity of measles (47.5%), mumps (50%), rubella (47.4%) and varicella (51.5%) IgG were observed among high social class compared to middle and low social classes but with no statistical significant differences. This was in agreement with Abu Zaid study, (41) which reveals non significant differences between social levels.

Our study showed that most of the studied vaccinated children had no history of measles, rubella or mumps infections. This is also supported by the Poethko Muller and Mankertz study in Germany (16)

Conclusion

The seroprevalence survey studies had important implications for the management of vaccine programs which contributes to the prevention of disease transmission. In this study seropositivity was higher in male than in female children with a significant difference for measles. Younger age groups were less seropositive than older age groups with significant differences except for measles. The highest level of seronegativity was seen with varicella specific antibodies. Higher seropositivity was observed in high social class and in children without past history of infection with no significant statistical results.

Recommendations

Immunization programs face many challenges: to introduce new vaccines, to achieve and sustain high coverage for those already in the program. There is a need for a planned program to prevent and control these diseases with the following strategies:

- Adding a 3rd dose of MMR vaccine at age 4-6 years old to increase the protective efficiency of vaccine and to be sure of the elimination of the diseases at the adolescence period.
- Introduction of MMRV vaccine instead of MMR for all children to avoid infection and serious complications, especially in older ages of children without or of unknown history of previous infection.
- Testing older children for varicella (IgG) to determine their vulnerability to vaccine before vaccination.
- Conduction of planned health awareness activities directed towards more orientation about Immunization.
- Adopt scientific advice on vaccines that will support policy makers in their decisions regarding the national vaccination schedules.

References

- 1- WHO. World Health Organization. Reported measles cases and incidence rates by WHO Member States 2013, 2014; .Geneva, WHO.
- 2- WHO: World Health Organization. Rubella vaccines: WHO position paper .Weekly epidemiological record 2011; No. 29, 86, 301-316.
- 3- Karcheva M, Atanasova M, Makaveevl and Daskalova M. Study on seroprevalence of mumps - specific IgG antibodies in a healthy population. Journal of IMAB -Annual Proceeding (Scientific Papers) 2010; vol. 16, 23-26.
- 4- Gnann J. Varicella-Zoster Virus Atypical Presentations and Unusual Complications, The Journal of Infectious Diseases. 2002; Volume 186, Issue Supplement, 1:91-98.
- 5- Okonko O, Onoja BA, Adedeji AO, Ogun AA et al., The role of vaccines in elimination and global eradication of measles: review of literature. African Journal of Pharmacy and Pharmacology 2009; Vol. 3(9): 413-425.
- 6- El Sayed N, N. Kandeel, I. Barakat, et al., Progress Toward Measles and Rubella Elimination in Egypt The Journal of Infectious Diseases 2011; 204:S318-S324.
- 7- WHO. World Health Organization. Central plan of action for Measles-Rubella campaign among persons aged 1-20 in Egypt. Phase I. Geneva 2008, WHO.
- 8- Saad A, Safi-El-Dine A and Al El-Shamy K. The Trend of Mandatory Vaccination among Children in Egypt. The Open Vaccine Journal; 2009;2:77-84.
- 9- Marin M, Broder KR, Temte JL, et al. Centers for Disease Control and Prevention (CDC). Use of combination measles, mumps, rubella, and varicella vaccine: Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Recomm 2010; 59(3): 1-12.
- 10- Fahmy SI and El-Sherbini AF. Determining simple parameters for social classifications for health research. Bull High Inst Public Health 1983; 235:1-14.
- 11- Erdman DD, Heath JL, Watson JC, Markowitz LE, Bellini WJ. Immunoglobulin M antibody following primary and secondary vaccination and natural virus infection. J Med Virol 1993;41:44-8.
- 12- Berbers GA, Marzec AH, Bastmeijer M, van Gageldonk PG, Plantinga AD. Blocking ELISA for detection of mumps virus antibodies in human sera. J Virol Methods 1993; 42: 155-168.
- 13- Matter L; Kogelschatz K; Germann D. Serum levels of rubella virus antibodies indicating immunity: response to vaccination of subjects with low or undetectable antibody concentrations. J Infect Dis 1997; 175(4):749-55.
- 14- Tayil S.E., Elshazly M.K., El Amrawy S.M. et al. Seroepidemiological study of measles after 15 years of compulsory vaccination in Alexandria. Eastern Mediterranean Health Journal 1998; vol. 4, No. 3.P: 437-447.
- 15- ChannaRA ,Hussain S ,Kaner NA et al., Sero-surveillance of measles amongst vaccinated and non-vaccinated children: An age stratified population based survey in Pakistan. African Journal of Pharmacy and Pharmacology 2012; Vol. 6(24) : 1713-1718 .
- 16- Poethko-Muller C and Mankertz A.: Seroprevalence of Measles-, Mumps- and Rubella-Specific IgG Antibodies in German Children and Adolescents and Predictors for Seronegativity. PLoS ONE 2012; 7(8): e42867.
- 17-TharmaphornpilasP,YoochareanP,-Rasdjarmrearnsook AR et al.: Seroprevalence of Antibodies to Measles, Mumps, and Rubella among Thai Population: Evaluation of Measles/MMR Immunization Programme.J HEALTH POPUL NUTR Feb 2009; 27(1):80-1606-0997
- 18- Nanbakhsh F, S Salari-Lak , F Broomand et al.: Evaluation of Rubella IgG Antibodies among High School Girls in Uremia City Iranian J Publ Health 2003; Vol. 32, No. 3, pp33.-36.
- 19- Schaffzin JK, Pollock L, Schulte C, Henry K et al., Effectiveness of previous mumps vaccination during a summer camp outbreak. Pediatrics 2007; 120(4):e862-828.
- 20- Harling R, White JM, Ramsy ME et al., The effectiveness of the mumps component of the MMR vaccine: a case control study. Vaccine 2005; 23(31):4070-4074..
- 21- Date AA, Kyaw MH, Rue AM, Klahn J et al., Long-Term Persistence of Mumps Antibody after Receipt of 2 Measles-Mumps-Rubella (MMR)Vaccinations and Antibody Response after a Third MMR Vaccination among a University Population. The Journal of Infectious Diseases 2008;197:1662- 1668.
- 22- Saha SK, Darmstadt GL, Hanif M, Khan R et al., Sero epidemiology of VZV in Bangladesh, Annuals of Tropical Pediatrics 2002; 22:341-345.
- 23- Gidding HF, MacIntyre CR, Burgess MA and Gilbert GL. The seroepidemiology and transmission dynamics of varicella in Australia. Epidemiol Infect. 2003;131:1085-1089.
- 24- Gabutti G, Penna C, Rossi M, et al., The sero epidemiology of varicella in Italy. Epidemiol Infect 2001; 126: 433-440 .

- 25- Kanra G, Isik P, Kanra A, et al., Complementary findings in clinical and epidemiologic features of mumps and mumps meningoencephalitis in children without mumps vaccination. *Pediatr Int* 2004; 46:663-668
- 26- Kim SS, Han HW, Go U et al., Sero-epidemiology of measles and mumps in Korea: impact of the catch-up campaign on measles immunity. *Vaccine*, 2004; 23: 290-297.
- 27- Kumakura S, Shibata H, Onoda K et al., Seroprevalence survey on measles, mumps, rubella and varicella antibodies in healthcare workers in Japan: sex, age, occupational-related differences and vaccine efficacy. *Epidemiol. Infect.* (2014); 142(1) 12-19. .
- 28- Hincapie-Palacio D, Lenis V, Ballesteros M et al., Seroprevalence of rubella in Colombia: a birth-year cohort analysis *Rev Saúde Pública* 2013;47(6):1-1
- 29- Karcheva M and Gancheva G. Seroprevalence of IgG antibodies against Mumps in Bulgarian Children under 18 Years of Age. *alkan Med J.* 2013; 30(1): 16-18.
- 30- WHO. World Health Organization. Desk review-Egypt-measles. Geneva, WHO. 2003.
- 31- Salmaso S, Gabutti G, Rota MC et al., Pattern of susceptibility to measles in Italy. *Bulletin of the* 2000; 78: 950-955.
- 32- WHO. World Health Organisation. Vaccine, Immunization, and Biological Study: Measles. World Health Organization publication. November .Geneva .WHO. 2000.
- 33- Gilbert GL, Escott RG, Gidding HF et al., Impact of the Australian Measles Control Campaign on immunity to measles and rubella. *Epidemiol. Infect.* 2001; 127: 297-303.
- 34- Sultana R, Rahman MM, Hassan Z and Hassan MS. Prevalence of IgG Antibody Against Measles, Mumps and Rubella in Bangladeshi Children: A Pilot Study to evaluate the need for integrated vaccination strategy. *Scandinavian Journal of Immunology* 2006; 64: 6846-6868.
- 35- Davidkin I, Jokinen I, Broman M, Leinikki P et al . Persistence of measles, mumps, and rubella antibodies in an MMR-vaccinated cohort: a 20-year follow-up. *J Infect Dis.* 2008; 197:950-956.
- 36- Salleras L, Dominguez A, Vidal J, Plans P, Salleras M, Taberner JL. Seroepidemiology of varicella-zoster virus infections in Catalonia (Spain): rationale for universal vaccination programs. *Vaccine* 2001; 19: 183-188.
- 37- Canadian Pediatric Society. Preventing varicella: Recommendations for routine two dose varicella immunization in children (Position Statement). *Paediatr Child Health* 2011; 16(7): 415.
- 38- Bartoloni A, Bartalesi F, Roselli M, Mantella A et al., Seroprevalence of varicella zoster and rubella antibodies among rural populations of the Chaco region, south-eastern Bolivia. *Trop Med Int Health* 2002; 7: 512-517.
- 39- Almuneef M.A, Memish Z.A, Balkhy H.H, Otaibi B et al., Seroprevalence Survey of Varicella, Measles, Rubella, and Hepatitis A and B Viruses in a Multinational Healthcare Workforce in Saudi Arabia. *Infect Control Hosp Epidemiol* 2006; 27:1178-1183.
- 40- ElersH, AbdelGalilTE, and SolimanOE. Seroprevalence of maternal IgG antibodies against measles, mumps, and rubella in infants in Dakahlia governorate. Msc Thesis. Mansoura university. 2005.
- 41- Abu Zaid A M , El-Shafie N .A. , Zaki S. M et al., Study of Age Related Significant Decline of IgG titer For Measles, Mumps and Rubella among Infants of Sharkia Governorate. MSC Thesis. Zagazig university. 2006.

Motivating People to Protect Their Sexual Health

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Introduction

Sexually transmitted diseases (STD) are among the most common causes of illness in the world. It is estimated that there is at least one new STD consultation per 100 persons per year in developed countries, while in many developed nations STDs rank among the top few diseases for which health care services are sought. In addition to the 20 or more microorganisms that are predominately transmitted by sexual activity, they have been joined during the last decade by the human immune-deficiency virus (HIV), which leads to AIDS. These diseases continue to be an important threat to the human and economic resources of communities.

Epidemiology

Sexually transmitted diseases are now the commonest group of modifiable infectious diseases in most countries. Their control is important considering the high incidence of acute infections, complications and sequelae, their socioeconomic impact, and their role in increasing transmission of the human immunodeficiency virus (HIV). STDs have reached endemic status in many developing countries. The incidence worldwide is estimated at over 125 millions cases yearly (1). The infection rate is similar in both women and men, but women and infants bear the major burden of complications and serious sequelae.

The sequelae of sexually transmitted diseases most seriously affect women and their infants. Apart from HIV Infection, in the post antibiotic era we do not suffer severe consequences of sexually Transmitted diseases.

It is recognized that care for patients with STDs and HIV infection will be provided by many different services and individuals, both medically qualified and otherwise, and that resources and training will vary considerably. They may include:

- categorical STD clinics;
- hospital outpatient and inpatient departments;
- primary health care centers;
- centers delivering mainly preventive care, such as maternal and child health facilities, family planning clinics, and youth centers;
- individual physicians, ranging from general practitioners to specialists, often in private practice;
- pharmacies and drugstores;
- traditional healers;
- self-styled "doctors" (quacks) and street vendors of antibiotics

Continuing changes in the understanding of the epidemiology, etiology and management of STDs, including HIV infection, pose a formidable challenge and delay efforts to design all-inclusive approaches and procedures applicable to all settings. Health-care administrators are charged with the integration of STD control activities into an existing PHC structure.

It is important in STD that (1)

- Diagnosis and treatment, the aim being rapid, inexpensive, simple, accurate diagnosis and inexpensive, effective treatment.
- Patient testing as a case-finding strategy for certain STDs, including gonorrhoea, chlamydial infection, syphilis, HIV infection and cervical cancer.
- The notification and management of sexual partners; partner notification has an important role in STD control strategies and needs to be included in patient management wherever resources and cultural conditions permit.
- Information, education and communication, and counseling; educational messages should relate to the patients' actual STD, but also include risk-reduction counselling appropriate both to the patient group concerned and to individual risk behaviour.
- The reporting of STD cases; reporting by "clinicians" is the major component of most STD surveillance systems.

Footnote: 1- Simplified approaches for sexually transmitted (STD); control at the primary health care (PHC) level. health care (PHC) level. Geneva, World Health Organization, 1985 (unpublished document WHO/VDT/85.437).

- Operational research; this is particularly needed to determine the best ways to manage patients, taking into account local factors, such as the availability of clinical, diagnostic and treatment services, as well as cultural and political ones.

1.1. Some current obstacles to STD control at the PHC level

In many developing countries facing health problems associated with high morbidity and mortality, trained personnel, laboratory facilities and funds are all extremely limited. Frequently, health centers must satisfy the need and demands of the 80-90% of the population living in the rural and peri urban areas. In the best case, they are staffed by medical and /or auxiliary workers and act as the first referral services for primary health care. These centers are expected to deliver integrated community health care, including curative and preventive services, and 10% or more of their daily workload may be related to STD and their complications. However diagnostic facilities at the PHC level are often either limited (microscope only) or non-existent. Furthermore, even in centers with access to better laboratory facilities, the delays in the reporting of test results and the limitations of the techniques used for STD detection may hinder timely treatment of infectious cases. Long waiting times for consultations, scarcity of drugs, and poor service are often encountered.

As a result, a varying but usually large proportion of STD patients resorted to self-treatment or are managed by traditional healers, drug vendors pharmacists, and self-styled practitioners outside the officially supported STD and public health services. Patients who can afford the expense of self care obtain it from private physicians, who seldom provide partner management and rarely report STD cases or follow official treatment guidelines. In some countries where prostitution is believed to play a significant role in the transmission of STD, "control programmes" tend to devote their resources almost exclusively to providing some measure of preventive STD diagnosis and treatment for these women. Unfortunately, such programmes are often of poor technical quality, reach only a small proportion (probably less than 20%) of the total prostitute population, and have failed to achieve a demonstrable impact on STD morbidity in the community. In addition, prostitute control programmes may interfere with the introduction of other STD control measures. Health policy-makers are frequently satisfied that, by implementing "prostitute control", enough is being done and additional resources need not be devoted to STD problems in the country.

A further difficulty is that antimicrobial resistance of STD organisms has become a major problem in most developing countries and has rendered some of the low-cost drug regimens useless. In addition, adoption treatment policies found effective elsewhere have led to serious consequences in some settings (e.g., inadequate treatment of infection due to penicillinase-producing *Neisseria gonorrhoeae* (PPNG) following abandonment of silver nitrate prophylaxis).

For all the above reasons, it is important that patients who seek care for STD/HIV-related problems, as well as their sexual contacts, be identified, properly managed, and referred, if necessary, to a higher level. The Group patient management protocols would not only contribute to these ends but would also have additional value as a means of assessing and improving other STD and HIV-infection control efforts.

General principles of STD control at the PHC level

The main aims of STD control are:

1. To interrupt the transmission of sexually transmitted infections.
2. To prevent the development of STD and their consequences.

This can be accomplished by:

1. Reducing disease exposure by advising individuals at risk to avoid sexual contact with persons who have a high probability of being infected.
2. Preventing infection by promoting the use of condoms or other prophylactic barriers.
3. Detecting and curing disease by providing effective and efficient diagnostic and treatment facilities, and promoting health-seeking behaviour.
4. Limiting the complications of infection by providing early and effective treatment for both symptomatic and asymptomatic patients and their contacts.

Strategies for STD control

The above aims can be achieved by means of the main STD control strategies discussed below, of which treatment, health education, the management of sexual contacts and partner notification are considered in detail in subsequent sections or annexes.

Disease detection

This strategy is implemented by using the following three tools:

1. **Screening**, i.e. the ascertainment of the probability of disease in populations or individuals not directly seeking health care, e.g. serological screening for HIV in blood donors or for syphilis in selected groups in the community.
2. **Case-finding**, i.e., the use of clinical and/or laboratory tests to detect infection in individuals seeking health care for other reasons, e.g., a serological test to detect syphilis in patients admitted to hospitals or in pregnant women attending antenatal clinics.
3. **Diagnosis**, i.e., the application of clinical and laboratory procedures to detect the cause of infection in individuals who present with symptoms and signs presumed to be caused by STD pathogens, e.g., the serological testing of patients with lesions suggestive of secondary syphilis or endocervical culture for *Neisseria gonorrhoeae* and *Chlamydia trachomatis*.

Treatment

Treatment is defined as the application of drugs, surgical procedures and other interventions to cure the patient's disease or ameliorate the symptoms. STD treatment usually refers to the application of antimicrobial regimens. The selection of an appropriate drug is determined by:

1. **Efficacy**, i.e., the ability to cure the disease. When coexisting infections are common, preference is given to drug regimens that can cure more than one of the STD infections likely to be present.
2. **Safety**, i.e., the absence of toxicity or side-effects.
3. **Convenience and compliance**, i.e., the ease with which the health worker can administer the drug and the patient receive it, and of patient compliance.
4. **The cost and availability of the drug.**

Health education

This strategy consists of the following components:

1. **Information**, i.e., activities that increase individual and community awareness and knowledge of STD
2. **Education**, i.e., efforts aimed at producing positive changes in attitudes and in health and health-seeking behaviours in STD and their prevention
3. **Counselling**, i.e., efforts aimed at increasing compliance with the clinician's advice and instructions on treatment, avoidance of re-exposure, risk reduction and consistent use of condoms by risk takers, and active collaboration in the referral of sexual partners. In patients attending health services, it is one of the mainstays of patient management.

Management of sexual contacts

This activity may be a direct result of patient counselling, which may include motivating the patient to assume an active role in bringing contacts for evaluation and treatment, or it may be implemented as an active search for STD contacts by health personnel. The appropriate management of STD patients must include the management of known contacts, in particular the regular sex partner (husband/wife) and the source of infection. This will often involve the application of full treatment regimens to all sexual contacts.

Clinical Services

Clinical services are usually provided at a clinic, hospital, private practitioner's office, health post, drugstore, or other facility providing the necessary privacy for the patient-clinician encounter⁽¹⁾. Most of the strategies outlined in section 2.1 are implemented within this context. Thus the clinician tries to provide adequate management by:

Footnote:

- 1 In this report the term "clinician" will be used to designate any person actually diagnosing and
- detecting or ruling out disease,
 - giving treatment, if necessary,
 - counselling the patient regarding disease prevention,
 - advising the patient on treatment compliance,
 - ensuring that the patient's contact(s) are evaluated and treated.

The clinician must realize that treatment of a case is only a part of proper STD management and control. The identification and treatment of sexual contacts, who are often asymptomatic, is important in limiting disease transmission in the community, and in preventing reinfection and the development of complications.

Support Services

In order to provide STD management, the following support services are necessary:

- Professional and technical training, to ensure that health personnel have the necessary knowledge and skills and the proper attitudes and behaviour to work in STD control.
- Laboratory services, since such services are extremely important in improving both patient management and the quality of epidemiological data. Unfortunately, such services are seldom available at the peripheral level.
- Information systems aimed at ensuring the flow of information between the peripheral, intermediate and central levels, and permitting epidemiological surveillance and the planning and evaluation of control activities. An adequate information system should include data gathering, collation, analysis and feedback.

Administration

An administrative system is necessary to support and supervise STD control activities and strategies. A person or group with managerial and policy-making skills should form part of the STD control programme. These administrators need not be STD specialists or even health workers, and will often have responsibilities extending beyond STD control and covering other PHC services (e.g., immunization, oral-dental care, family planning). A designated person must be administratively responsible for:

- Planning, directing and organizing activities,
- Procuring and administering resources, including drugs and other supplies.

National Centres

In each country and/or region there will usually be individuals with the knowledge and skills necessary to establish a viable STD control program. Unfortunately, this national or regional expertise is often not recognized or used sufficiently by health authorities. Whenever possible these experts should be brought together in a group representing the various disciplines (e.g., clinical medicine, microbiology, laboratory science, epidemiology,

behavioural science and health administration) and institutions (e.g., academic and professional organizations, social security institutes, the army and labour or private organizations) necessary for STD control. In some countries, the formation of such a group of experts, aids by community leaders and others from public and private organization has resulted in the development or strengthening of a national "STD centre of excellence", which then becomes the technical-scientific and policy-making focus for STD control. This centre can:

- Provide professional and technical training,
- Act as a reference laboratory,
- Conduct operational research (especially the highly necessary evaluation of appropriate diagnostic tests and treatments),
- Conduct epidemiological surveillance activities,
- Guide supervision, evaluation and policy-making activities.

Integration of STD control at the PHC level

Categorical STD control programs and special STD clinics are effective but expensive, and the latter, in particular, usually reach only small segments of the population. Owing to the scarcity of categorical resources and the predicted worldwide increase in the sexually active population risk, the health problems posed by STD will have to be addressed within the framework of existing PHC services. The STD control strategies and components outlined above need not be implemented as "special" categorical programs.

Thus, although a categorical technical-scientific and supervisory approach should continue to be maintained at the central level, the persistent prevalence of STD, especially in some developing countries, and the facilitating role in the transmission of HIV infection, argue for broadening the basis of STD and HIV-infection control activities within the context of general health services. The most feasible approach is to increase the contribution of the PHC level to STD Prevention and control.

The cornerstone of STD control, whether a categorical or an integrative approach is adopted, must be the clinical services, in other words the provision of appropriate and adequate STD patient management. STD patients in some PHC facilities have already been managed by non specialist clinicians, mainly using a syndrome-based approach following the guidelines contained in the WHO document previous guidelines, the spread of HIV infection and its relationship with the other STD, and the increase in the antimicrobial activity of several sexually transmitted pathogens have all necessitated the updating of STD management protocols.

Counselling and Health education

The term "counsellor" is used to describe an individual providing information, education and counselling on STD, including HIV infection. A wide range of health-care workers, including clinicians, nurses and auxiliaries, can act as counsellors. The important issue is not who does it but how well it is done.

General principles

Counselling on STD, HIV infection is based on the following principles:

1. Information on STD, HIV and risk reduction should be easily accessible to all patients seeking STD services.
2. Staff must adopt a non judgemental attitude. The aim of counselling is to help the patient to explore alternatives and make the most appropriate choice(s).
3. No assumptions should be made about how much patients know or their life-style, as this may result in relevant information not being given and/or patients finding it difficult to ask questions, e.g., about particular sexual practices .
4. Monitoring and evaluation are necessary in order to learn what patients feel about the health education and counselling service, and how it can be improved.
5. Confidentiality must be assured.

Practical aspects

In the provision of counselling, the following are important:

1. Guidelines on information appropriate to the community served and the local epidemiology should be available to all providers of STD services.
2. Guidelines on risk reduction should also be available. It is particularly important that these are appropriate to the patient's culture and beliefs.
3. Training and counselling for providers of STD services as part of their clinical training should be encouraged.
4. Patients should generally be counselled alone but, when appropriate, provision can be made for them to be seen with their partners. Privacy is important, as is allowing patients adequate time to discuss their problems.

Health education

Health education is an adjunct to one-to-one counselling, not an alternative. It provides key messages that are not usually very detailed, and does not involve discussion of the patient's own circumstances.

General principles

Health education on STD, including HIV infection, is based on the following principles:

1. Messages should be clear, accessible and appropriate to the audience.
2. Messages must not vary in content, particularly when a number of different media are used.

3. Pilot studies of the materials and methods to be used should be carried out in order to evaluate their effectiveness. Except in categorical STD clinics with extensive resources, this will be difficult, but national programme managers of combined or separate AIDS and STD programmes should arrange for such studies and for evaluation to be conducted by reference centers.

Practical aspects

When health education is to be provided, it is first necessary to determine:

(i) what media channels are available; (ii) the information to be communicated; and (iii) how the messages will be communicated, e.g. in words, pictures or diagrams.

Media channels

While health education is most easily provided in STD clinics, hospital outpatient departments, PHC centers, and clinics for maternal and child health and family planning, it should also be encouraged in consultations with doctors in private practice and other care providers. Posters, leaflets, videos and group or one-to-one discussions can all be used. The various factors to be taken into account in deciding whether posters, leaflets or videos should be used are discussed below.

Posters

Posters are useful for clear, simple, short messages (e.g., alerting patients to risks, methods of risk reduction such as condom use, or counselling services) and for suggesting questions for patients to ask during a consultation, but they are not useful for providing detailed information.

They do not need to be professionally produced; posters produced by clinics or local organizations may make the message more relevant to the patient. Posters need to be culturally appropriate and should not offend or embarrass, e.g., posters directed at homosexual men in a setting where large numbers of heterosexual men are present may reinforce the belief that only homosexual men are at risk.

Leaflets

Leaflets have a wider application than posters and can provide more detailed information. They can be made available at STD clinics, PHC centers, clinics for maternal and child health and family planning, and the offices of doctors in private practice. Leaflets are useful for providing basic information, e.g., on the HIV antibody test, before a consultation, and for reinforcing information given during a consultation, e.g., details of sexually transmitted infections and guidelines for safer sex. Leaflets should be written in clear, non specialist language, free of jargon. Colloquialisms or slang can make the messages more understandable. Diagrams that clarify the text, e.g., on how to use a condom, are useful.

Videos

In some clinics, short videos are shown repeatedly and can provide more information than posters yet be more personal than leaflets. They may be combined with

discussions, e.g., on how to put guidelines for safer sex into practice. The disadvantages are the high costs of production and of the projection equipment.

Specific patient groups

Health education material can be aimed at specific patient groups. The issues involved will be different for women, heterosexual men, homosexual men, prostitutes and intravenous drug users. Consideration should be given to strategies that reach core groups with high rates of infection, e.g., prostitutes.

At information sessions and workshops, patients can be encouraged to exchange experiences and strategies for implementing risk-reduction methods. Peer support of this type has been used in developing countries to encourage individuals to make behavioural changes. Thus groups of prostitutes working with a facilitator can discuss the occupational risk to their health and even their lives, as well as condoms and how to persuade clients to use them.

Risk reduction counseling

Importance of risk reduction

Patients seeking advice on STD or HIV infection either have been at the risk of infection or perceive themselves to have been so. Behavioural change is most likely to occur if they recognize that:

- even if their current infection is curable, a future STD may not be (e.g., infection with HIV, human papillomaviruses, or human (alpha) herpes virus 1 or 2);
- future infections may be asymptomatic until permanent damage has occurred, e.g., tubal occlusion and infertility after chronic pelvic inflammatory disease;
- other STD may facilitate the acquisition of HIV infection;
- a risk activity for other STD is also a risk activity for HIV infection.

It is important, therefore, that individuals consider risk reduction so as to avoid contracting infections in the future, whether or not they are in principle curable.

Communicating information about risk reduction

It is essential that the risk reduction counsellor both thoroughly understands modes of transmission and guidelines for safer sex, and feels comfortable discussing sex and sexuality. This is more difficult when sexually transmitted infections are not the clinician's main responsibility; training may therefore be required to overcome potentially counterproductive embarrassment or unease in health workers.

Patients should be given guidelines on safer sex and, where appropriate, additional information on safer ways to inject drugs. It is important to remember that drug users may attend STD clinics either to seek advice on STD or to be tested for HIV.

Risk reduction should be discussed with the patient and written information provided both as a reinforcement and so that details are not forgotten.

The counsellor must be honest about what is known and what is not, e.g., the actual risk of transmission of HIV through oral sex. Patients should be encouraged to err on the side of caution when making decisions about engaging in activities for which the degree of risk is unclear. The counsellor should start by asking patients what they understand by safer sex in order to assess their level of knowledge and determine whether any misconceptions exist. Information should be volunteered on all aspects of safer sex likely to be relevant to the patient. This reduces the risk that information will not be acquired because of embarrassment. Information that is clearly irrelevant to the patient should not be given as this may reinforce the feeling that others are at risk. Terms and language understood by the patient should be used, including slang as necessary.

The routes of transmission of infection should be explained so that patients understand the reasons underlying the guidelines for safer sex and can assess risk situations that have not been covered in the counselling session. Counselling should not consist of "don'ts". Safe activities should be emphasized and patients encouraged to think of other ways to enjoy sex. The point should be made that safer sex can be fun and exciting. Finally, information on condom use for both vaginal and anal intercourse should be given (see Annex 5).

Risk reduction in practice

Information on its own is not enough to reduce the risk of STD transmission. The patient needs to be able to incorporate risk reduction into his or her life-style. The following general principles can be laid down:

- advice should be appropriate to the patient's life-style;
- changes made by the patient should not lead to isolation and loss of personal contact;
- changes should be realistic and maintainable.

On the practical side, the counsellor should:

- explore patient's circumstances and life-styles;
- discuss how to cope with situations where there is potential risk if it is not possible to avoid them;
- encourage patients to generate their own solutions;
- discuss how and when to raise the question of safer sex with partners, strategies for dealing with negative reactions;
- encourage patients to set limits for themselves on the degree of risk that they are prepared to take;
- help patients to take action to prevent future infection (in a low-prevalence area, a patient may feel reluctant to accept any behavioural changes aimed at reducing risk);
- advise women not only on the risks of sexually transmitted infections, but also on those of unwanted pregnancy, and give contraceptive advice or direct them to family planning services if they so wish.

The objective is to encourage risk reduction and enable the patient to bring up the subject of safer sex with partners. The counsellor should concentrate on reducing the risk in the long term rather than eliminating it in the short term.

Counselling of patients with diagnosed STD

Whether the STD is a curable bacterial infection or a treatable but not curable viral infection, the following should be discussed with the patient in addition to risk reduction:

- the treatment;
- whether the infection is curable, and if not what the long term effects will be;
- the complications, if any;
- when sex can be resumed;
- the special issues of fertility, pregnancy and risks to neonates;
- the fact that the infection was caught from one partner and may already have been transmitted to others;
- the possibility that infected partners may be asymptomatic;
- the risk that reinfection can occur if sex is resumed with an untreated partner;
- the consequences to a partner of failure to receive treatment;
- the risk of other unsuspected STD, including HIV infection;
- partner notification.

Except in areas where HIV infection has been shown not to exist, specific information, and education counselling on HIV infection should be given. Patients at risk of HIV who have not recently been tested should be offered HIV counselling and testing.

Counselling before HIV antibody testing

Where HIV antibody testing is available, pre-and post-test counselling should be provided. Counselling needs to be individualized as no approach is suitable for all situations. The following are a few important points calling for consideration.

HIV testing is not a risk reduction measure per se. For some patients, a negative test will help in effecting behavioural change. For others, however, a negative test may reinforce a belief that risk is low and therefore risk reduction unnecessary. In addition a negative antibody test is no protection against HIV infection. Risk-reduction information should always accompany pre- and post-test counselling.

The HIV is not a test for AIDS, but for infection with the virus. However, seroconversion does not immediately follow infection; it may not happen until weeks or months afterwards.

Being identified as HIV-positive may lead to difficulties in obtaining dental and medical care, exclusion of some types of employment, and ineligibility for a visa or work permit in some countries.

Finally, both negative and positive results may have implications for existing relationships.

Implementing STD health education and counselling

When a health education and counselling service for the reduction of the risk of infection with STD agents, including HIV, is established or developed, it is necessary to consider how such a service can be incorporated into the health-care system. In most situations, the work will be done during a consultation with a clinician. If specific STD/HIV counsellors are employed, they will usually be working in a categorical STD clinic or PHC facility where many cases of STD are treated. The following questions must then be addressed:

- Will there be an open-door policy or an appointment system?
- Which patients will be referred and will the referral system work?
- If resources are inadequate, how will priorities be set and met?
- What training will be available?
- How will the evaluation and monitoring take place?

Since 1981, the attention of nations has been riveted by the acquired immunodeficiency syndrome (AIDS) epidemic. As a consequence, many public health programs have been forced to make sacrifices. "Other" sexually transmitted diseases (STD), which had never taken their appropriate place among the nation's health priorities, have been almost dismissed as less dramatic, less deadly, and thus less important. Yet, studies have shown that these diseases are more dangerous than ever, as risk factors in the acquisition and transmission of HIV infection.

Impact of AIDS on STDs

Although STDs have become more prevalent, more dangerous, and more costly to society, the fight against them has also become more politicized. This politicization has, of course derived from the politics of the AIDS epidemic, and future efforts to control STDs will be tied inextricably to the resolution of these political issues.

The AIDS epidemic has had both positive and negative impact on the issue of STDs. On the positive side, biomedical and behavioural research on AIDS may provide information that will benefit other STDs. Open discussion of sexual issues, particularly between parents and children as well as in schools and churches was needed long before the AIDS epidemic. Increased attention to and use of condoms and spermicides to prevent HIV infection can also prevent other STDs. Some of its negative effects are that

AIDS has drained resources, personnel, and funds from other STD efforts, thus delaying the initiation of new STD research and prevention programs.

AIDS has absorbed the attention and energies of many STD researchers, whose laboratories now are devoted, at least in part, to investigation of HIV.

AIDS has dominated press interest, and thus the public is not as aware of the prevalence and dangers of other STDs.

Although AIDS education programs have been widely supported with millions of dollars, almost no national public education programs have been designed or funded to inform and educate the public about STDs and the risk they pose. Mixed messages about the risk of heterosexual transmission of HIV may be a contributing factor in the increased incidence of some STDs.

Finally, AIDS has added to the stigmatization of people with sexually transmitted diseases, who in some cases may be the disadvantaged and disenfranchised of our society.

The expectation that fear of AIDS would bring about sufficient behaviour changes in all populations to decrease cases of STDs was a false one. Behaviour change among homosexuals has resulted in significant decrease in STDs among that group; however, reported increases in STDs have occurred almost exclusively among heterosexuals, and disproportionately among minorities. Part of the dramatic rise in syphilis infections and other STDs among heterosexuals has been attributed to crack cocaine use and the exchange of sex for crack.

Solutions to the STD epidemics will not result from behaviour change alone but will also require a major commitment to basic research, behavioural studies vaccine research, epidemiology, health education, multidisciplinary and interdisciplinary collaboration, medical training, and innovative and comprehensive prevention and control programs. Most importantly, control of STDs demands resources: resources that historically have been sorely lacking.

STD prevention and control

The problem of inadequate support for STD prevention existed long before the AIDS epidemic. STD control programs have been confronted.

Outbreaks of antibiotic resistant strains of gonorrhoea, the need to prevent pelvic inflammatory disease and ectopic pregnancy, the rise of viral disease rates such as herpes and human papillomaviruses (HPV), the recognition of chlamydia, the association of some STDs with genital cancers, and the relationship of these diseases to infertility and reproductive problems remain a focus. Given diminishing resources and a significant diversion of personnel and funds for AIDS activities over several years, the control program of the CDC for other STDs has been forced to compensate, investing almost all of its state grant funds in control of syphilis and gonorrhoea, diseases that are preventable and treatable. Other STDs, particularly viral ones, simply cannot be addressed.

Viral diseases

Traditional public health strategies of testing, treating, and contact tracing can be applied easily to a disease like chlamydia, which has a short incubation period, an available diagnostic test, and treatment. The major obstacle to integrating chlamydia into STD control programs is resources. Viral STD programs, however, cannot be managed in the same manner. These diseases have longer incubation times, periods of latency and recurrence, costly diagnosis, and expensive methods of treatment without "cure". Thus, state grant funds are not devoted to the control of genital herpes or HPV, which may be the most prevalent STDs in the United States today.

STD control, therefore, requires new approaches as well as resources. Not only are STD clinics testing and counselling sites for HIV, but they must deal with "new" STDs and the consequences of sexual and drug using behaviours that may cause them. Innovative new strategies, such as community-based integrated health services, must be designed and evaluated to allow STD clinics to appropriately respond to the nature of these epidemics in the 1990s. Such services should also encompass consideration of drug use, contraceptive use, and the special needs of minorities. In addition, these new programs could be designed to encourage collaboration between public health departments and academic institutions, particularly to enhance training.

Public education

An important component of these prevention and control strategies is public education. Although millions of dollars have been allocated to public education on AIDS, currently no nationwide coordinated public education initiatives have received high priority or funding by the US federal government. A new advertising campaign funded by the CDC, targeting information about AIDS for parents and youth, has been expanded to highlight the risk of STDs and their role in the transmission of AIDS. This is an important step. More creative ways of disseminating STD prevention messages, particularly to minorities, women, and young people are necessary, but again, competing priorities have prevented adequate resources for such endeavours.

One private pharmaceutical company, Burroughs-Wellcome Company, has initiated a series of advertisements promoting the "genital self-examination" to educate the public about STDs and encourage them to seek medical care if they are at risk. Although the campaign by its nature will be biased toward infections that cause visible genital lesions and will not necessarily address asymptomatic disease, it is at least a step toward increasing public awareness of the importance of these diseases and the risks of contracting them.

The only national program funded by the CDC to inform the American public about STDs is the national STD hotline, operated under contract by the American Social Health Association. Because little has been done to advertise the hotline on a wide scale, most of the millions of Americans

who have or are at risk for STDs are unaware of this valuable information and referral service.

Facilities

The national STD hotline refers callers to local STD clinics where they can receive free or low cost services. These facilities need upgrading and improvement to make them more accessible to people at risk, and they need appropriate technology and equipment for diagnosis of all STDs. Holmes and others(5) suggested that patient care, medical research and physician training would all be better served by establishing coordinated efforts between health departments and medical schools, eventually relocating public STD clinics to settings within medical school-affiliated hospitals.

Training

Such an objective would help to alleviate one of the most chronic needs in this field: training of medical professionals. The prevention and control of these diseases depends upon adequate training of professionals on three levels: (1) medical and nursing school students; (2) STD control personnel; and (3) basic, clinical, and behavioural researchers.

Training of medical students in control of STDs traditionally has been poor. In 1982 Stamm, Kaetz, and Holmes(9) conducted the only study in the past 20 years of clinical experience in STDs. They determined that medical training in the area of STDs was declining despite increasing importance of the diseases within a wide variety of subspecialties of medicine. They found that with an average of 6 hours of clinical training per student, given to only 30% of students in only 35 medical schools, the average length of clinical training in venerology in the United States and Canada is approximately 2 to 3 hours per medical student (assessed as being poor quality in half of the programs) compared with 10 hours per student in the United Kingdom.

Dr. Willard Cates, Director of the Division of STDs, recently announced that an unpublished study revealed that merely 10 % of primary care physicians stated that they take sexual histories of their patients to help determine their risk of STDs.

Training in the area of STDs requires special attention for another reason. The specialty of infectious diseases, for example, exists at virtually every medical center, with training programs and all the attending support, clinical research, and teaching activities. This is not true for STDs. New STDs researchers and trainees in the United States have come not from the larger pool of infectious disease departments, but from only two or three medical centers in the country. Even those centers do not have resources adequate to meet the needs of training, retention of junior faculty, and developmental grants. The US is, thus, facing a burgeoning STD problem without developing the appropriate academic university infrastructure required to control it except in a very few places.

STD research

The scientific framework and technology that allow the development of disease prevention and control strategies are provided by the biomedical research of the National Institutes of Health (NIH). Prevention and control efforts would be greatly enhanced by vaccines, better and less expensive diagnostic tools, and effective treatments, particularly for the viral STDs such as herpes and human papillomaviruses that remain incurable and persistent.

The AIDS epidemic has diverted resources from STD research as well as prevention services. There is a serious dearth of new investigators of STDs and very few established ones. The list of research needs is a long one. Space permits mention of only a few:

No vaccines exist for any STDs except hepatitis B and herpes. A more inexpensive and rapid diagnostic test is needed for chlamydial infection, which would permit routine testing in STD, family planning, antenatal and other appropriate clinical settings. The pathogenesis and natural history of syphilis, and HPV infections are not yet fully understood. The nature of subclinical infection, latency, and reactivation of the herpes virus must be studied, and more must be learned about the association of HPV with increased risk of cervical cancer. A behavioural research branch within the NIH should be established to evaluate the efficacy of behaviour modification for primary secondary prevention of STDs in the US. Studies must be expanded to determine the role of STDs in the acquisition and transmission of HIV and to determine the effect of HIV infection on the clinical manifestations of other STDs.

Cases of STDs are increasing at dramatic rates, at enormous societal and personal cost. The epidemic of AIDS has diverted needed funds, personnel, and other resources from nation's programs of research, training, prevention, and control of STDs. Ironically, the epidemics of STDs, the diseases themselves and the sexual and drug-using behaviours surrounding them, are now fueling the HIV epidemic. Although it is often said that education is the only prevention of AIDS, in fact there is another important and cost-effective component of HIV prevention: the control of other STDs.

STDs are not only public health concerns, but issues of biomedical research, economics, access to care, public and professional education, drug use, poverty, and last but not least politics. Their prevention and control demands new research approaches, the development of necessary expertise, and a major and sustained investment of resources.

Sexually transmitted diseases and the primary care provider

The past decade, however, has seen a reversal of the trend of decreasing STD rates that marked previous decades. The recent emergence of viral STDs as a prominent problem, the increasing proportion of penicillin-resistant

Neisseria gonorrhoeae, the emergence of chlamydia as a major and growing problem, and the resurgence of chancroid and syphilis, both previously under good control, all challenge complacency. These changes remind us that we battle a diverse army of organisms that fight to survive and flourish even as we attempt to free ourselves of their effects. These efforts are countered by a remarkable ability on the part of these organisms to quickly adapt to our new weapons. *Neisseria gonorrhoeae*, for example, has developed the ability to resist progressively stronger doses of penicillin, and finally penicillin itself, through mechanisms that include chromosomally mediated resistance and production of beta lactamase. Other factors related to recent STD changes include a growing population at risk, a progressive liberalization of attitudes toward sex in our culture, and most recently, drug-related behaviour, including the exchange of sex drugs.

Changing patterns of contraceptive use are also important: first, in the remarkable achievement of uncoupling sex from pregnancy, and more recently, in the decreases of the portion of women using intrauterine devices (IUDs) and oral contraceptives. This decrease has been offset only partially by the increased use of barrier contraceptives, with the net result that a greater portion of women are not consistently using contraceptives.

The most dramatic development in the STD field has been the epidemic of the human immunodeficiency virus (HIV). If there is a silver lining in this plague, it is perhaps the increased attention afforded all diseases that are transmitted through sexual activity.

Primary care is often an area in which societal concerns are transformed into treatment of individuals. This is true particularly in the field of STDs because it is primary care providers who most often are the first physicians consulted, making them frequent providers of curative medicine. Perhaps more important is the role of the primary care provider to disseminate messages about preventive care that can help avoid STDs. The long-term relationships of primary physicians with patients provide the opportunities for respect and trust that are necessary to effectively convey messages about prevention. Thus, the primary care physician provides services similar to those provided by other physicians in dealing with STDs: education and counselling, diagnosis, treatment, and referral of sexual contacts. The primary care provider's unusual, in some cases unique, opportunity comes from being able to do so more effectively.

What are the obstacles that have prevented a comprehensive attack on STDs? Hindrances include inadequate funding for research, treatment, and public health measures such as contact tracing, development of effective educational approaches for prevention, and the answering of questions relating to attitudes and values regarding sexuality. In addition, STDs tend to be highly stigmatized. Typically associated with "illicit" sexual behaviour, they have been often viewed by both patients and physicians as a source of embarrassment, if

not shame. This attitude has encouraged a public silence about these diseases.

Sex education, when it did occur, often emphasized the dangers of sexual activity by focusing on unwanted pregnancies and STDs. Rarely did sex education provide clear information about birth control or how to avoid STDs. Moreover, there has been considerable reluctance to discuss the nature and frequency of sexual activity, especially that among adolescents.

The disinclination to address the problem of STDs publicly has made medical intervention that much more difficult. Typically, medical approaches that emphasized easier access to treatment and public education about transmission and prevention have been opposed by those who identified the problem as an essentially moral issue. According to this moral approach, the best way to avoid STDs is to abstain from sex. Utilitarians and moralists have contested the optimal approach to elimination of STDs throughout the 20th century. Adherents of the moral approach argue that the simple medical approaches to intervention and treatment actually encourage more infections unwittingly encouraging and promoting sexual behaviour. Advocates of the medical orientation counter that the moralists promote infection by restricting access to explicit information and preventive techniques. This debate has persisted in current thought regarding the AIDS epidemic and other STDs. Of course, the critical question for primary care providers has been how best to serve their patients.

Tools for the primary care provider

Timely information

In an age of increasing information flow, STD control has advanced from improvements in data acquisition, analysis, and dissemination. The practitioner now has immediate access to the most recent statistics, recommendations, literature, and prescribing information through on-line facilities that provide timely answers to a variety of questions, using specially designed software that requires a minimum of expertise use.

Improved Training

As STDs have emerged as a prominent health problem, especially with development of the HIV epidemic, clinical training has increased in quality and quantity. As recently as 1982, little formal or practical training in sexually transmitted diseases was provided for medical students or house officers. Today, training has increased markedly, a change accompanied by an increase in the number of STD-related journals and more STD-related articles are appearing in the general medical literature. This attention is appropriate in view of the magnitude of the STD problem and most STDs being imminently diagnosable and treatable.

Diagnostic Advances

A marked change came with the introduction of tests that use monoclonal antibodies, which for the first time made possible receiving test results in a matter of hours. Today, a

new generation of tests make office-based testing in small quantities practical with enzyme-linked immunosorbent assays (ELISA) tests. These provide the clinician the opportunity to diagnose chlamydia, gonorrhoea, or herpes in a matter of minutes at a cost of several dollars for each test. In addition to being able to establish a diagnosis, these tests offer the physician other advantages. First, they make possible screening of patients for whom screening had previously been impractical. For example, being able to test routinely for chlamydia trachomatis in sexually active but asymptomatic women will help reduce the incidence of infertility and ectopic pregnancy that result in such infections. Second, physicians in the office will have the same laboratory feedback as physicians who work in STD clinics. Finally, physicians can use these screening tools to track STD prevalence and help determine whether to provide empiric judgment. Future evolution of research tools such as a polymerase chain reaction that tests for the presence of precise DNA sequences promises tests that have a high ability to predict the presence of disease.

Lessons for the primary care provider

As the physician who is often the first consulted for a variety of illnesses, the primary provider has the responsibility for both curative and preventive medicine. These providers are thus crucial to controlling STDs.

1. Education and Prevention

Education and prevention messages form a foundation for good health and should be stressed repeatedly. Visits for well care, particularly in sexual areas such as contraceptive counselling, should include messages about minimizing risk factors for sexually transmitted diseases. Indeed, the only reason that a young, healthy person may visit a physician is to obtain contraceptives. When young people are ill may be one of the few instances when they feel vulnerable, which may present a unique opportunity to effectively convey messages about preventive efforts.

People tend to dichotomize most of life's risks, particularly those that are complex or obscure (generally including medical questions) into a "yes" or "no" determination of whether they are at risk. Most people see themselves at low risk for STDs, which translates to a "no".

A primary care provider's role in education is particularly important with adolescents who generally lack reliable information regarding sexuality, rather obtaining it from his or her peer group. The family is generally not a strong influence because of parental discomfort with sex education. Despite efforts to provide school-based sex education, there remains little evidence that these programs are effective in reducing sexual activity, use of contraceptives, or teenage pregnancy⁽¹⁰⁾. This information takes on added importance with the realization that adolescents and young adults have the highest rates of STDs.

2. Awareness

The presence of STD risk factors should heighten sensitivity to a possible STD diagnosis, but remember that each patient is an individual. Factors associated with the

highest degree of risk include being a sexually active person less than 25 years old, having multiple sexual partners within the past six months, and having a history of previous STDs. Many physicians see patients who clearly do not fit into this high risk profile yet remain at risk. For example, factors consistently associated with a risk of contracting an STD include having a new sex partner within the past month, having a history of STDs, being young, being black, having an urban residence, and abusing drugs. Probably the most significant risk factor is multiple partners; among women, this may also be reflected as having partners who have multiple other partners. Some of these risk factors are surrogates for complex behaviors that are difficult to define. For example, although being black is generally a significant factor, there is nothing about race itself that alters susceptibility; rather, this indicator tends to be linked with behaviors that place an individual at risk.

In an era of strong concern regarding HIV infection, an STD should be viewed as a warning signal. Although most are curable, the viral STDs of HIV, herpes, and papillomavirus, which is linked with cervical cancer, are not. If your patients have a treatable STD, it is a warning sign for contraction of other STDs that may be lifelong, develop silently over long periods of time or even be fatal.

3. Knowledge

Be aware of the manifestations, treatments of common STDs, and recommendations about reporting and follow-up for sex partners. Contraceptives are important modifiers of STD risk. Barrier contraceptives, in the form of condoms, spermicides, contraceptive sponges, and diaphragms, decrease the probability of transmitting STDs. The protection of all of these contraceptives is highly dependent on whether they are used, so patients should be instructed carefully in their use and encouraged to use them with each encounter, particularly in view of recent reports that suggest that condoms are not used consistently even among high-risk groups. Care also should be taken to use them properly as well as consistently; guidelines for condom use have been published. The likelihood of having severe consequences of STD infection is enhanced by IUDs, most notably pelvic inflammatory disease and are contraindicated in women who are at risk for STD infection. Oral contraceptives have been found to increase the cervical carriage rate of chlamydia and possibly of gonorrhea and increases the possibility that women who use them may wish to use a barrier contraceptive as an adjunct for their protection against STDs.

4. Non-judgmental Approach

This means an attitude which does not stigmatize an individual for his or her views and avoids placing value judgments on whether activities are "normal". Make liberal use of open-ended questions. Confidence and trust necessary to effectively deal with patients is wanting without this necessary ingredient. Keep in mind, too, that sex is frequently impulsive, gratifying behavior, rather than a planned action such as brushing one's teeth. More complete details about sexual history taking and education are beyond the scope of this article but are presented elsewhere.

5. Stress Education and Prevention

Patients should be presented with a list of options rather than dictates about reducing risk. These include sexual abstinence, changing sexual practices to modify or eliminate such activities as anal intercourse, reducing the number of partners, careful selection of partners who practice safe sex, and examination of partners.

6. Follow-up

Follow-up for infected persons is a critical step to breaking the chain of transmission, particularly in an age when the most common STD, chlamydia, is frequently asymptomatic. This includes following the patient to assure cure; assuring that sexual contacts are contacted, tested, treated, or both tested and treated; and in some cases, notifying health departments. Most states have trained investigators who are thorough and discrete.

Although test-of-cure cultures are generally recommended, notably for gonorrhea, patients who obtain symptomatic relief rarely bother to return. Danger exists when an antibiotic with intermediate sensitivity suppresses symptoms but fails to eradicate disease. With other diseases such as chlamydia, failure to follow a full course of therapy is probably usual. Stressing the need for compliance is important, but an individualized assessment may also change your choice of antibiotic, route of administration, or both.

Referral facilities should include those where patients can receive HIV testing and counseling, such as hospitals in the event of more serious illness, family planning and contraceptive services, and substance abuse services.

Conclusions

The proliferation of STDs makes it likely that a primary physician will be confronted with a problem related to sexual activity. The mutual trust and respect between primary care providers and their patients, often established over a long period, places these physicians in an unusually effective position in dealing with STDs. Though these physicians must diagnose, treat, and refer contacts as any other, their relationship allows effective counseling and education to occur over a long period of time and to be tailored to the needs and concerns of individual patients.

References

- Andrist LC: Taking a sexual history and educating patients about safe sex. *Nurs Clin North Am* 23:959-973, 1988.
- De-Schryver-A, Meheus-A. Epidemiology of sexually transmitted diseases: The global picture. *Bull-World-Health-Organ.* 1990; 68(5): 639-54
- Goldsmith MF: "Silent epidemic" of "social disease" makes STD experts raise their voices. *JAMA* 261:3509, 1989
- Goldsmith MF: Sex tied to drugs - STD spread. *JAMA* 260:2009, 1988. Medlars: The World of Medicine at your Fingertips. Washington, DC, National Institutes of Health, NIH Publication 86-1286, 1986.

- Holmes KK, Stamm WE: Measures to control chlamydia trachomatis infections: An assessment of new National Policy Guidelines. JAMA 256:1178,1986
- Rosenberg MJ: Influence of contraceptives on vaginal ecology and infections. In Mardh PA, Horowitz B (eds): Proceedings of the Second International Symposium on Vaginitis and Vaginosis. New York, McGraw-Hill, in press.
- Rosenberg MJ: Spermicides, condoms, STDs, and trichomoniasis. Br J Sex Med 16:310. 1989.
- Stamm WE, Kaetz S, Holmes KK: Clinical training in venerology in the United States and Canada. JAMA 248:2020-2024, 1982.
- Stout JW, Rivara FP: Schools and sex education: Does it work? Pediatrics 83:375-379, 1989.

Are female patients and the elderly at a higher risk for Vitamin D deficiency?

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Abstract

Introduction: Vitamin D deficiency is common in healthy Saudi adults. Studies have reported that vitamin D deficiency is more prevalent among females and the elderly.

Objectives: To assess the prevalence of vitamin D deficiency at both gender and age groups

Method: Cross sectional study of 646 adult Saudi patients

Result: 559 participants out of 646 had vitamin D deficiency (86.5%) (<50nmol/l), with more deficiency among males than females (89.3% vs. 84.7%), however the proportion of females who had severe deficiency (<25 nmol/l) was higher than males (40.7% vs. 32.4%) with P value = 0.006.

Conclusion: In contrast to current concepts, this study showed that male and younger patients had higher rates of vitamin deficiency; the exact reasons need to be carefully sought.

Key words: Vitamin D, deficiency, Age, male, female

Introduction

Vitamin D deficiency is a worldwide problem affecting more than one billion people[1] in different countries, mainly those with temperate climates that receive inadequate sunshine, in the middle east where females fully or partially cover their bodies [2-5], and in developed countries where vitamin D fortification has been implemented[6].

According to some studies, the groups that are at risk of vitamin D inadequacy are the following; breastfed infants, older adults, people with limited sun exposure, people with dark skin, people with inflammatory bowel disease and other conditions causing fat malabsorption, and people who are obese or who have undergone gastric bypass surgery[2, 3]

Vitamin D, also known as the sunshine vitamin, can be produced in the body with mild sun exposure or consumed in food or supplements. Vitamin D plays an important role in bone metabolism, when deficiency leads to secondary hyperparathyroidism, increased bone loss and osteomalacia[7-9]. In addition to bone metabolism, vitamin D deficiency is associated with increased cardiovascular risk, mood disorder and depression, type 1 and 2 diabetes mellitus and other health problems[10-12]. The major source of vitamin D for most humans is cutaneous synthesis by exposure to sunlight ultraviolet B radiation which contributes more than 90% to the serum concentration of vitamin D[13, 14].

Vitamin D deficiency affects both genders, at all age groups[15], however there is no consensus between studies regarding which gender or age group is affected more than the other[16-20].

The aim of this study is to assess the variation of vitamin D deficiency between genders and age groups among an adult Saudi population.

Methods

A cross-sectional study of 646 consecutive adult patients (age >18 years) who came for a check-up and other reasons at the Family Medicine Center (Al Yarmouk) at King Abdul-Aziz Medical City for National Guard in Riyadh during the period from September 1st until 30th of December 2014.

Inclusion criteria:

Adult (18 years and above) Saudi patients of both genders who were not a known case of vitamin D deficiency and not on vitamin D supplement.

Exclusion criteria:

Those with a history of any of the following problems: parathyroid gland disease, hyperthyroidism, liver disease, renal disease, epilepsy, cancer, inflammatory bowel disease, malabsorption, celiac disease, gastric bypass, bowel surgery, pregnant or lactating women, or if patient on any medication can affect vitamin D level (such as Calcium or vitamin D supplement), anticonvulsant, osteoporosis drug therapy, chemotherapy and anti-tuberculosis (isoniazid, rifampin).

Vitamin D level testing:

A serum sample of 5ml was obtained from each participant to assess the serum 25(OH) D concentration. Serum 25-OH- vitamin D₂/D₃ was measured by the LIAISON 25 OH vitamin D, total assay use Chemiluminescent immunoassay (CLIA) technology.

Vitamin D deficiency cut-off is the subject of many debates. The Endocrine Society, the Institute of Medicine (IOM), and the World Health Organization (WHO) have different definitions[21, 22]; according to IOM and WHO, a serum 25(OH)D level above 50 nmol/L is adequate for at least 97.5% of the population[22, 23].

This study used the cut-off value of <50 nmol/L for vitamin D deficiency, because King Abdulaziz Medical City laboratory has recently changed the cut-off from <75 nmol/l to <50 nmol/l by adopting the IOM definition.

Vitamin D deficiency (severe) is considered when the total 25-OH Vitamin (D₃ + D₂) is <25 nmol/l (10 ng/ml), suboptimal (insufficiency or minimal to moderate deficiency) when the level is 25-50 nmol/l (10-20 ng/ml)[22].

Data was analyzed using the Statistical Package for Social Science (SPSS) version 20., P value of < 0.05 is considered significant.

Results

646 patients were included in the study; 253 (39.2%) were males and 393 (60.8%) were females. Mean age was 54.2±13.1 for all participants, and age for males was

50.9±11.7, while it was 56.3±13.5 for females (P=0.000). Table 2 shows the age, gender distribution and Vitamin D levels. The highest age group was for those ≤ 50 years (47.4%) and they were equally distributed according to gender. Age group of >70 years was the lowest presented (15.0%) and females were more than males (18.1% vs 10.3) in this age group.

The mean vitamin D level is 33.6±17.2 nmol/l for all patients, and the range is (10.0 -116.0 nmol/l). The mean for males and females was almost similar (33.4±14.2 nmol/l for males vs. 33.8±18.9 for females). 559 (86.5%) of the participants had Vitamin D deficiency (<50nmol/l). There was a statistical difference (P=0.006) in vitamin D deficiency (<50 nmol/l) between genders with males having a higher proportion than females (89.3% vs. 84.7%), however the proportion of females who had severe deficiency (<25 nmol/l) was higher than males (40.7% vs. 32.4%). However when the prevalence was recalculated using the higher cut-off of <75 nmol/l, it was 97.1%.

Among the age group of ?50 years, 148 (96.1%) females had vitamin D deficiency (<50 nmol/l) compared with 141 (92.9%) males, and had more severe vitamin D deficiency (<25 nmol/l) compared with males (54.5% vs. 32.9%).

The odds ratio (OR) for females in this age group is 1.9 times to have vitamin D deficiency (<50 nmol/l) more than males (Table 3), while for the age group of 50 - 70 years, the OR of females was 0.5 and for the age group >70 years, the OR was 0.3 and lastly, the OR for females in all age groups was 0.66.

The OR for younger (<50 years) female to have severe Vitamin D deficiency (<25 nmol/l) is 2.5, while it was 0.5 in all age groups.

Younger patients (<50 years) had the lowest level of vitamin D, mean is 29.2 + 13.5, while age groups (50-70 years) had higher levels, 35.7 + 18.9 and the highest level 42.1 + 19.2 for those >70 years old. This result is reemphasized by a significant positive correlation between age and vitamin D levels (r=0.308 and P=0.000), with more deficiency among younger age groups and Figure 1 shows a positive relationship between vitamin D level and age.

Discussion

In spite of the fact that Saudi Arabia is located in 18o latitude and sunshine is adequate all year round [24], vitamin D deficiency among the participants of this study was high (86.5%), which was supported by many reports from Saudi Arabia[2-4, 25-31] and other countries [3, 20, 32-38]. However, some reports found that lifestyle may influence vitamin D level more than the latitude[18].

Recently, the National Guard hospital laboratory has changed the cut-off of vitamin D deficiency from <75 nmol/l to <50 nmol/l, adopting the IOM definitions. The use of different cut-off levels would significantly change the prevalence of vitamin D deficiency. Results from studies

that used the cut-off of <50 nmol/l documented a congruence of bone beneficial effects at that level but not at <75nmol/l[3, 39].

Females were at lower risk for vitamin D deficiency than males (OR = 0.66), a finding that few studies reported[16, 20]. However, this finding contradicts the notion that a female is at more risk for vitamin D deficiency[18, 28, 29, 31, 37, 40].

Many studies supported this study that younger females were more severely vitamin D deficient than males (OR = 2.5)[25, 27, 30]. Nabi et al discussed various factors that contribute to female vitamin D deficiency in Saudi Arabia, like, housing design, religious rules, lifestyle and dark skin color[25].

Many studies reported that age is an independent predictive risk factor for vitamin D deficiency[5, 29], and unlike other reports, this study documented that vitamin D deficiency was associated with younger age. Few studies supported this finding [18, 26, 37, 40] however, other studies found that vitamin D deficiency was more among elderly people. Moreover, elderly are at risk for vitamin D deficiency[16, 18, 28, 29].

A number of factors are associated with vitamin D deficiency, these are: low vitamin D intake, racial (dark skin), high BMI, young age group, low salmon consumption, shorter duration outdoors, and higher coffee consumption[40].

In this study, vitamin D level was found to be increasing with age, contradicting other reports. Several studies found that serum 25(OH)D level decreased with increasing age[4, 40]. This may be attributed to the fact that aging decreased the capacity of the skin to produce 7-dehydrocholesterol[41]. However, there were also reports that support the finding of our study, documenting that younger individuals had a lower serum 25(OH)D level compared to older subjects[41-43]. This discrepancy between studies may be due to other factors like socio-cultural factors, such as a tendency to work indoors and avoidance of sunlight exposure in the younger generation. However, the reason for the higher level of serum 25(OH)D and age in this study was not known.

Vitamin D plays an important role in diverse physiological functions, in addition to its role in bone homeostasis. Vitamin D deficiency can be serious if untreated, because it can lead to many health problems. These include rickets, osteomalacia, and osteoporosis that can lead to pathological bone fracture and disability [1, 14, 44].

Vitamin D deficiency is related also to all the elements of the metabolic syndrome, hypertension, obesity, insulin resistance and glucose intolerance. Many studies demonstrated the effect of vitamin D as an immunomodulator on a variety of autoimmune diseases such as multiple sclerosis (MS), rheumatoid arthritis (RA), inflammatory bowel disease and systemic lupus erythematosus (SLE)[45, 46],

Vitamin D deficient patients may present with one or more of these symptoms: bone pain, muscle cramps, weakness and tingling. They may present with symptoms related to specific diseases that are caused by vitamin D deficiency[24, 44-49].

Arabs in general, including the Saudi Arabian population have dark skin, which may be a contributing factor for high prevalence of vitamin D deficiency. Experimental studies showed that individuals with darker skin pigmentation had a lower 25(OH)D level after UVB radiation exposure[50, 51]. The effect of skin color was also shown in a study in the United States, where the prevalence of vitamin D deficiency varies between white and black populations, and showed that hypovitaminosis D was observed in 11.7% among white American people vs 43.1% in black[34, 35].

Avoidance of sunlight in summer is probably the main factor contributing to vitamin D deficiency in Saudi Arabia[52, 53].

There are limitations of the study, such as; the participants may not represent the whole Saudi population community because it was conducted in one family medicine centre, with participants who share common features. The confounder factors were not studied which may affect the results if included. Finally the reasons for vitamin D deficiency were not sought.

Conclusion

The result of this study is contradicting the current notion, where females and the elderly are considered independent risk factors for vitamin deficiency. This study found that males and young individuals are at a higher risk for vitamin D deficiency. The exact reasons for these findings need to be carefully studied.

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References

1. Plotnikoff GA, Q.J., Prevalence of severe hypovitaminosis D in patients with persistent, nonspecific musculoskeletal pain. *Mayo Clin Proc*, 2003. 78: p. 1463-70.
2. Mutt, S.J., et al., Vitamin D and adipose tissue-more than storage. *Frontiers in physiology*, 2014. 5.
3. Chin, K.-Y., et al., Vitamin D status in Malaysian men and its associated factors. *Nutrients*, 2014. 6(12): p. 5419-5433.
4. Ardawi MS, Q.M., Rouzi AA, Maimani AA, Raddadi RM., Vitamin D status in relation to obesity, bone mineral density, bone turnover markers and vitamin D receptor genotypes in healthy Saudi pre- and postmenopausal women. *Osteoporos Int*, 2011. 22: p. 463-475.
5. Rahnavard, Z., et al., Vitamin D deficiency in healthy male population: Results of the Iranian multi-center

- osteoporosis study. *Iranian journal of public health*, 2010. 39(3): p. 45.
6. Palacios, C. and L. Gonzalez, Is vitamin D deficiency a major global public health problem? *The Journal of steroid biochemistry and molecular biology*, 2014. 144: p. 138-145.
 7. Holick, M.F., High prevalence of vitamin D inadequacy and implications for health. *Mayo Clin Proc*, 2006. 81(3): p. 353-73.
 8. Dhesi, J.K., et al., Vitamin D supplementation improves neuromuscular function in older people who fall. *Age and ageing*, 2004. 33(6): p. 589-595.
 9. Erkal, M.Z., et al., High prevalence of vitamin D deficiency, secondary hyperparathyroidism and generalized bone pain in Turkish immigrants in Germany: identification of risk factors. *Osteoporos Int*, 2006. 17(8): p. 1133-40.
 10. Wang, T.J., et al., Vitamin D deficiency and risk of cardiovascular disease. *Circulation*, 2008. 117(4): p. 503-511.
 11. Carlson, M., Vitamin D and Depression. 2010.
 12. Mathieu, C., et al., Vitamin D and diabetes. *Diabetologia*, 2005. 48(7): p. 1247-1257.
 13. H. Stracke . M. F. Holick . , M.Z.E.J.W.Y.B.A.A.E.D.R. H.B.M.M.R.G.B., High prevalence of vitamin D deficiency, secondary hyperparathyroidism and generalized bone pain in Turkish immigrants in Germany: identification of risk factors. *Osteoporos Int*, 2006. 17 p. 1133-1140.
 14. Terrence H Diamond, J.A.E., Rebecca S Mason. Vitamin D and adult bone health in Australia and New Zealand: a position statement. *Medical Journal of Australia*, 2005. 182((6)): p. 281-285.
 15. Lips, P., et al., The prevalence of vitamin D inadequacy amongst women with osteoporosis: an international epidemiological investigation. *J Intern Med*, 2006. 260(3): p. 245-54.
 16. Lippi, G., et al., The burden of vitamin D deficiency in a mediterranean country without a policy of food fortification. *Acta Bio Medica Atenei Parmensis*, 2015. 86(1): p. 59-62.
 17. Verdoia, M., et al., Impact of gender difference on vitamin D status and its relationship with the extent of coronary artery disease. *Nutrition, Metabolism and Cardiovascular Diseases*, 2015. 25(5): p. 464-470.
 18. Yu, S., et al., The High Prevalence of Hypovitaminosis D in China: A Multicenter Vitamin D Status Survey. *Medicine*, 2015. 94(8): p. e585.
 19. Nakamura, K., et al., Impact of demographic, environmental, and lifestyle factors on vitamin D sufficiency in 9,084 Japanese adults. *Bone*, 2015.
 20. Heald, A., et al., Measuring vitamin D levels: surrogates are insufficient. *International journal of clinical practice*, 2014.
 21. Holick, M.F., et al., Evaluation, treatment, and prevention of vitamin D deficiency: an Endocrine Society clinical practice guideline. *The Journal of Clinical Endocrinology & Metabolism*, 2011. 96(7): p. 1911-1930.
 22. Ross, A.C., et al., The 2011 report on dietary reference intakes for calcium and vitamin D from the Institute of Medicine: what clinicians need to know. *The Journal of Clinical Endocrinology & Metabolism*, 2011. 96(1): p. 53-58.
 23. Organization, W.H., Prevention and management of osteoporosis: report of a WHO scientific group. 2003: Diamond Pocket Books (P) Ltd.
 24. Lips, P., Vitamin D status and nutrition in Europe and Asia. *Journal of Steroid Biochemistry & Molecular Biology*, 2007. 103: p. 620-625.
 25. Nabi, G., Y. Hobani, and M. Sarwat, High Prevalence of Vitamin D Deficiency and Cancer in Saudi Arabian Populations: Can We Hypothesize a Link? *Medical Hypotheses*, 2015.
 26. BinSaeed, A., et al., Determinants of vitamin D deficiency among undergraduate medical students in Saudi Arabia. *European Journal of Clinical Nutrition*, 2015.
 27. Hussain AN1, A.A., El Shaker M, Raef H, Gabr A, Arch Osteoporos, 2014. 9(1):190.
 28. Alfawaz, H., et al., Vitamin D status among patients visiting a tertiary care center in Riyadh, Saudi Arabia: a retrospective review of 3475 cases. *BMC public health*, 2014. 14(1): p. 159.
 29. Alsuwaida, A.O., et al., Prevalence of vitamin D deficiency in Saudi adults. *Saudi Med J*, 2013. 34(8): p. 814-818.
 30. Al-Elq, A.H., The status of Vitamin D in medical students in the preclerkship years of a Saudi medical school. *Journal of family & community medicine*, 2012. 19(2): p. 100.
 31. Elshafie, D., H. Al-Khashan, and A. Mishriky, Comparison of vitamin D deficiency in Saudi married couples. *European Journal of Clinical Nutrition*, 2012. 66(6): p. 742-745.
 32. Salah M. Mahdy, S.A.A.-E., Izzat A. Khanjar, Mohammed M. Hammoudah, Housam A. Sarakbi, Abdul-Rahim M. Siaml., Vitamin D status in health care professionals in Qatar. *Saudi Med j*, 2010. 31(1): p. 74-77.
 33. Gharaibeh MA, S.B., Assessment of serum 25(OH)D concentration in women of childbearing age and their preschool children in Northern Jordan during summer. *Eur J Clin Nutr*, 2009. Nov; 63((11)): p. 1320-6.
 34. Lisa B. Yanoff, S.J.P., Amanda Spitalnik, Blakeley Denking, Nancy G. Sebring, Pamela Slaughter., The prevalence of hypovitaminosis D and secondary hyperparathyroidism in obese Black Americans. *Clin Endocrinol (Oxf)*, 2006. May ; 64((5)): p. 523-529.
 35. MJ., M.K., Difference in Vitamin D Status between countries in young adult and elderly. *Am j med*, 1992. 93: p. 69-77.
 36. Marianna D. Unger, L.C., Silvia M. Titan, Maria T. Magalhaes, Ana L. Sasaki, Luciene M. dos Reis, Vanda Jorgettil. , Vitamin D status in a sunny country: Where has the sun gone?. *Clinical Nutrition*, 2010. 29(784-788).
 37. Bachhel, R., N.R. Singh, and J.S. Sidhu, Prevalence of vitamin D deficiency in north-west Punjab population: A cross-sectional study. *International Journal of Applied and Basic Medical Research*, 2015. 5(1): p. 7.
 38. Alipour, S., A. Saberi, and A. Seifollahi, Risk Factors and Prevalence of Vitamin D Deficiency Among Iranian Women Attending Two University Hospitals. *Iranian Red Crescent Medical Journal*, 2014. 16(10).
 39. Rosen, C.J., et al., IOM committee members respond to Endocrine Society vitamin D guideline. *The Journal of Clinical Endocrinology & Metabolism*, 2012. 97(4): p. 1146-1152.

40. Nakamura, K., et al., Impact of demographic, environmental, and lifestyle factors on vitamin D sufficiency in 9084 Japanese adults. *Bone*, 2015. 74: p. 10-17.
41. MacLaughlin, J. and M.F. Holick, Aging decreases the capacity of human skin to produce vitamin D3. *Journal of Clinical Investigation*, 1985. 76(4): p. 1536.
42. Ho-Pham, L., et al., Vitamin D status and parathyroid hormone in a urban population in Vietnam. *Osteoporosis international*, 2011. 22(1): p. 241-248.
43. Riverin, B., et al., Prevalence of Vitamin D insufficiency and associated factors among Canadian Cree: A cross-sectional study. *Can J Public Health*, 2013. 104(4): p. e291-e297.
44. Bakhtiyarova, S., et al., Vitamin D status among patients with hip fracture and elderly control subjects in Yekaterinburg, Russia. *Osteoporos Int*, 2006. 17(3): p. 441-6.
45. Boonen, S., et al., Addressing the musculoskeletal components of fracture risk with calcium and vitamin D: a review of the evidence. *Calcif Tissue Int*, 2006. 78(5): p. 257-70.
46. Diamond, T.H., et al., Osteoporosis and spinal fractures in men with prostate cancer: risk factors and effects of androgen deprivation therapy. *J Urol*, 2004. 172(2): p. 529-32.
47. Frost M, A.B., Nielsen TL, Hagen C, Andersen M, Brixen K., Vitamin D status and PTH in young men: a cross-sectional study on associations with bone mineral density, body composition and glucose metabolism. *Clinical Endocrinology*, 2010. 73((5)): p. 573-580.
48. Holick, M.F., The vitamin D deficiency pandemic and consequences for nonskeletal health: mechanisms of action. *Mol Aspects Med*, 2008. 29(6): p. 361-8.
49. Holick, M.F., Diabetes and the vitamin d connection. *Curr Diab Rep*, 2008. 8(5): p. 393-8.
50. Armas, L.A., et al., Ultraviolet-B radiation increases serum 25-hydroxyvitamin D levels: the effect of UVB dose and skin color. *Journal of the American Academy of Dermatology*, 2007. 57(4): p. 588-593.
51. Libon, F., E. Cavalier, and A. Nikkels, Skin color is relevant to vitamin D synthesis. *Dermatology*, 2013. 227(3): p. 250-254.
52. Al Anouti, F., et al., Vitamin D deficiency and sun avoidance among university students at Abu Dhabi, United Arab Emirates. *Dermato-endocrinology*, 2011. 3(4): p. 235-239.
53. SH., S., Vitamin D status of Saudi men. *Trop Geogr Med*, 1984. 36(2): p. 181-7.

