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Contents

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From the Editor

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I would like to start by announcing that the January 2008 edition will be a special issue on the development of Family Medicine in the region. We would like to encourage authors to submit papers on the special theme for January 2008.

In the Focus on Quality Section Dr Bener A & Afifi M discussed the issue of research and policy in the Arab World. They stressed that research alone is no silver bullet for health development. In our countries, health research is fragmented where there is little communication between research producers, users, and policy makers. It is long debated whether policy processes run well ahead of research-based evidence or that researchers are not selecting the appropriate "horses for courses". The authors attempted to answer several important issues including how do the medical journals constitute a crucial part of the research process? And how could medical journals ensure the quality of the published research as well as the effectiveness of its peer review process?

This issue has a number of papers dealing with metabolic disorders. A cross sectional study of patients with diabetic foot ulcers seen in 2 hospitals in Basrah, stressed that diabetic foot ulceration is a serious and expensive complication with considerable morbidity that affects up to 15% of diabetic patients during their lifetime. Nerve conduction studies were performed using standard protocols. The authors concluded that clinical findings correlated with the severity of electrophysiological changes in patients with diabetic foot ulcers.

A second study from Kuwait looked at the Prevalence of Metabolic Syndrome in primary Health Care. The authors utilized a cross-sectional study of consecutive Kuwaiti participants aged between 20-60 years during March, April, May, and June 2006. Four-hundred and ninety five participants were interviewed in detail about their social, demographic, socio-economic, lifestyle and health and disease status was done by using the WHO stepwise approach to surveillance of non communicable diseases steps after translation to Arabic. The authors stressed that the prevalence of metabolic syndrome is high among Kuwaiti participants attending primary health clinic in Kuwait. They recommended that doctors in the primary care setting should be aware of the five risk factors related to metabolic syndromes with a view to offering appropriate treatment.

A study from Jordan, on Chronic Headache, investigated the role of the Nasal Septum Deformity in chronic headache . A total of fifty eight patients were studied . Twenty-five patients (43%) had headaches preoperatively occurring at least once a month for 1 to 10 years (mean 4.5 years). After surgery, eighteen of the 25 patients with headaches (72%) experienced relief of their headaches at a mean follow-up period of 13 months. The authors concluded that nasal septum deformity is presented as an easily diagnosed and readily correctable cause of chronic headache.

Immunization practices were discussed in two papers from the region. A study from Pakistan looked at vaccination practices and factors influencing an expanded program of immunization in the rural and urban areaa. A cross sectional observational survey was conducted for a total of 440 respondents. The authors concluded that starting immunization of infants in urban and rural areas is satisfactory but full immunization of infants is not as satisfactory, especially in the rural setup and that they are often missed in the repeated doses of vaccination. They stressed that maternal education and occupation are the main factors that strongly affect the immunization of children and EPI program goals. A second paper from Bangladesh discussed immunization coverage among slum children. The authors attempted to identify important effects of some selected variables in complete child immunization coverage. With regard to immunization coverage for the children under age five who were still alive at the time of the survey, the figure for full immunization was higher (92.3%) in the higher ages (24+ months) than the age 12-23 months (89.5%). The results show that the partial immunization coverage among the children is gradually decreasing when the age of the child increases.

A study from Bangladesh discussed the issue of rising caesarean section rate in developed countries. The authors stressed that the steady rise in CS rate is an emerging issue of concerned workers in mother-child health care and a matter of international attention. The authors stressed that unnecessary CS has resulted in increased infection, hemorrhage, organ damage, drug complications, prematurity, increased neonatal illness, and longer hospitalization. The authors stressed that national CS rates do not reflect what is happening locally, supporting the trend toward monitoring rates at the level of individual hospitals or physicians.

Research to policy in the Arab world: lost in translation

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Abstract

Research alone is no silver bullet for health development in the Arab world. In our countries, health research is fragmented where there is little communication between research producers, users, and policy makers. It is long debated whether policy process runs well ahead of research-based evidence or researchers are not selecting the appropriate "horses for courses". In this current short review we will explore why does research evidence have little influence on health policies? We also would point to some factors that could promote the linkage and integration of researchers and policy makers. We also explain the expected role and goals of health research departments or units in the Arab world, along with the different strategies to be adopted for health research dissemination and communication. This is followed by recommendations for promoting research integrity and the quality of studies; which, in its turn, would help in increasing policy makers' trust, develop their interest in research-informed policy making, and work on fostering the research- policy link. Accordingly, the role of ethics' committees and sub-committees, the importance of developing or adopting health research guidelines, and the role of medical associations would be explained. Finally, answers to two important questions would be figured out. Firstly, how do the medical journals constitute a crucial part of research process? Secondly how could medical journals ensure the quality of the published research as well as the effectiveness of its peer review process?

Introduction

Research is a structured process of collecting, analyzing, synthesizing, and interpreting (explaining or describing) data to answer theoretical questions not visible in data themselves. Policies are governmental or organizational guidelines about allocation of resources and principles of desired behavior.1 Policy making is the process by which governments translate their political vision into programs and actions to deliver outcomes – desired changes in the real world.

Health policies are of three categories: governance policy which relates to organizational and financial structures; service policies which cover resource allocation issues and pattern of services, and practice policies which relate to the use of resources by practitioners in delivering patient care. For each category, analysis of the link between policy-making and of research utilization, often identifies at least three broad areas of activity: policy agenda setting, policy formulation, and policy implementation. 2

The phases of the policy-making process are 3:

- Policy formulation (creating a common vision, goals and objectives, setting the agenda, information and data on existing conditions, engaging key interest groups)
- Policy alternatives (generate and evaluate alternatives, research)
- Policy decision (agreement, approval processes, enactment)
- Policy implementation (regulations, plan, budget, competency, capacity, monitoring)
- Policy review (adaptation or change)

Factors affecting the policy process:

1. Nature of processes: e.g. core versus secondary issues, early intervention within the policy formulation phase could have greater influence than at the end of the legislative process.
2. Links between decision making and level of scrutiny: Decision taking has been divided into three main types – routine, incremental and fundamental. At each stage, the level of data, information and knowledge becomes more complex.

- Routine decisions are regular with a focus on keeping the status quo with minimal amendments to design and no changes to principles or values. At this level of decision-making, data and analysis are sufficient to understand and to modify the current situation.
- Incremental decisions deal with selective issues as they occur, but do not deal systematically or comprehensively with constituents. Consequently a level of policy analysis is sufficient to identify alternatives and compromises on the selected issues.
- However, fundamental decisions occur rarely and aim at re-examining the policy in its entirety. The level of scrutiny of the issues is intense, backed up with research, debate and comprehensive consultation. 4,5

3. Role of research

Various methodologies exist and are promoted by research units in developing countries to influence policy decisions. Examples are dissemination of research results, interaction between researchers and policy makers during each phase, public dissemination of research results in mass media, or strengthening capacity of researchers who will develop future policy. Based on research into the policy-making process by the IDRC in 2001, the literature review [6] identifies issues related to the role of research in policy making. These include the use of knowledge, and the type of policy framework.

A. Use of knowledge

In the process of policy-making, data, information and knowledge are imperative for rigorous decision making. However, a distinction in the perception of researchers and policy makers regarding knowledge makes the use of research more complex. For policy makers, research is one source of knowledge in the policy-making process.

B. Policy frameworks

To comprehend the policy-making process, the frameworks (such as linear, incremental, interactive, agenda-setting, policy networks, policy narratives and policy transfer) [6] provide a way of explaining the factors contributing to the process. The frameworks also provide ways of planning interventions to influence policy outcomes and to provide an analysis of when and how stakeholders may or may not be consulted.

What is the evidence-based policy?

Policy should be based on evidence; either the context free evidence which concerns what works in general, or the context sensitive evidence which deals with the conditions of implementation. The Canadian Health Service Research Foundation defined evidence as "[the] information that comes closest to the facts of a matter. The form it takes depends on context. The findings of high-quality, methodologically appropriate research are the most accurate evidence. Because research is often incomplete and sometimes contradictory or unavailable, other kinds of information are necessary supplements to or stand-ins for research. The evidence base for a decision is the multiple forms of evidence combined to balance rigor with expedience, while privileging the former over the latter" [7].The evidence from research should be broadened to anticipate the dynamics of the process and the involvement of an appropriate range of actors, but without compromising on rigor of knowledge or exclusion of stakeholders. [5]

What is the existing situation in the Arab world?

The existence of relevant health research, though necessary, is not sufficient. Research alone is no "silver bullet" for health in developing countries. To be of benefit, research should legitimize some polices and throw doubts on others. The study of the role of research in child health policy and programs in Pakistan found some examples of immediate clear-cut linkage between research and decisions. However it shows that research was under-utilized.[8] Similarly, in the Arab world, health research is fragmented; there is little communication between research producers, users and policy makers. Moreover, there is virtually no information on the linkages between health research and health policy in developing countries. [9]

Researchers and decision makers tend only to connect, if they connect at all, around the products of their process. This is a less than opportune time to insert research into the policy process, which is actually not an event. Researchers' view to decision making as an event fails to do justice to the nature of policy making process. Equivalently, research is viewed by policy makers as a retail store, where products from not processes within the research community are what concerns decision makers. [10] Actually, researchers and policy makers fail to face three challenges; what are the best solutions to the most burdensome health problems, what are the best ways to fit these solutions into the complex health system, and what are the best ways to bring about the desired changes in the health systems. [11]

Abdur Rab [12] investigated the utilization of research results in five EMRO countries namely Egypt, Morocco, Iran, Sudan, and Pakistan. He found that, in some of these countries, research reports are sent to health authorities for information. A formal mechanism does not appear to exist in any of the five countries for scrutinizing research reports to select those where the results may have policy or program implications. The heads of institutions who were interviewed in Egypt, felt that results of research on communicable disease and on health systems are more likely to be used by authorities. In Sudan, interviews with senior health managers indicated that results of research are more likely to be used when the Ministry has specifically commissioned it. The decree for establishing policy-making councils for applicable research in all the medical universities in Iran, is an interesting innovation for promoting 'utilizable research'. The close links between the researchers and health service personnel in Iran, both belonging to the same Ministry, may account to some extent for this positive experience. Abdur Rab [12] concluded that the need of a much improved linkage between the demand side (users of research) and the supply side (the producers of research) has emerged very clearly from his study. In other words the inter-linkage of research to policy, needs to be developed and strengthened. He added that (?)we will need a new orientation for health researchers and as well as for policy makers and managers in the health ministries. The capacity of users to articulate their research needs and to critically appraise research findings (sadly lacking at the moment) need to be developed as a priority. [12]

Health policies, not infrequently, do not reflect research evidence to the extent in theory that they could. Policy makers sometimes need unequivocal and rapid research, or want final answers (or covers for their decisions), not predictable conclusions that "more research is needed". [1] Whether policy process runs well ahead of research, or researchers are not selecting the appropriate "Horses for Courses" i.e. conducting the right research in the right place at the right time, is difficult to answer. [13] Sometimes the researchers might be unprepared or unwilling to communicate their results to the public or to decision makers; they accept that publication of results in scientific journals is sufficient to bring them into eventual use.

Why does research have little influence on policy?

Black [14] mentioned some reasons why research evidence has little influence on service policies: policy makers have goals

other than clinical effectiveness, research evidence dismissed as irrelevant, complexity of research evidence or scientific controversy, other types of competing evidence as personal experience, social environment not conducive to policy change, or poor quality of knowledge purveyors. [14]

Troslte et al.[1] looked for factors that promoted or impeded exchanges between researchers and policy makers. These were in turn divided into emphasis on content, actors, process, and context, summarized in table 1. [1]

Promoting responsible conduct of research fosters the research-policy link:

Responsible conduct of research (RCR) is the responsibility of individuals, the research institution, and the medical journals as well. Training on research methodology and biomedical ethics, mentoring, developing research policy, adopting guidelines for the conduct of research, availability and functioning of ethics committee, research integrity-oriented information to authors in medical journals, are some of the strategies to promote research integrity (RI) and responsible conduct of research in the Arab world.

Promoting research integrity and RCR would increase policy-makers' trust, develop their interest in research-informed policy making and work on strengthening or fostering the research - policy link. Moreover, managing research integrity is a part of the research institutions' responsibilities to the general public, which in turn certainly affect the later perception to the institutions' commitment with this regard. Ethics committees, developing or adopting research guidelines, the national medical associations, the role of medical journals, constitutes crucial tools to promote RI and will be discussed hereafter.

How could we promote research integrity, which in turn would foster the link?

1. Ethics' committee:

The most important body in promoting RI is the ethics committees on the national level and the institutional review boards (IRBs) on the institutional level. Ethics committees and IRBs should apply the common principles of autonomy, non-maleficence, beneficence and justice to research proposals but with variable weighting as the ethical requirements differ markedly between the various countries. In ensuring that ethical standards are met and research has scientific merit, ethics committees have obligations to participants (to meet their rights and protect them from harm); to society (to ensure good quality research is conducted); and to researchers (to treat their proposals with just consideration and respect). [15] Ethics committees scrutinize research proposals to ensure that they are scientifically valid with rigorous methodology. Scientific validity of the study, fair selection of the study participants, favorable risk-benefit ratio, independent reviewing process, informed consent, respect for recruited participants and the study community, collaborative partnership and the social value of the study are the ethical principles of biomedical studies. [16] Moreover, a sub-committee for fieldwork monitoring is required to ensure the researcher's adherence to their proposals as well as to the ethical principles.

2. Health research guidelines

Developing or adopting research guidelines is crucial to promote RI. In 1990, Nobel surveyed medical schools regarding research guidelines and found that only 13% had general institutional guidelines and 19% were considering developing guidelines, whereas 68% stated that they neither had nor were considering developing or adopting guidelines. [17] In the United States, the Office of Research Integrity (ORI) is responsible for protecting the integrity of the research supported by the grants awarded for the Public Health Services (PHS) extra-mural research program.[18] After ten years of Nobel [17] study, the Office of Research Integrity (ORI) conducted a study questioning : how many accredited U.S. medical school have guidelines that relate to the conduct of research and what topics are addressed by the guidelines. Of 125 accredited medical schools, 98 (78.4%) had some form of research conduct guidelines. However, most individual institutional guidelines suffer to some extent from limited focus and fragmentation in the development of guidelines. Table 2 shows the different topics, which should be included in an ideal guideline for conduct of research, fitting into clusters. Only 46% had guidelines relating to data management; 37% had guidelines relating to publications and data dissemination; 56% (partially) covered investigator's role and 94% discussed legal issues. Thus, more than half of current guidelines cover no more than two of the four clusters in table 2. Accordingly, it was concluded that there is still a great need for development of more comprehensive written guiding principles.[19] Similarly, Ministries of Health in the Arab countries should be encouraged to develop or adopt guidelines for responsible conduct of research to promote research integrity within its national program that aim to improve the quality and effectiveness of health care.

3. The role of medical associations

The Medical Associations in our Arab world could also play an important role in leverage of the professional strengths of their members by adopting research methodology and ethical issues in its continuous medical education programs. Members who violate research ethics deliberately could be subjected to disciplinary actions for their deeds as well as those with medical ethics violations or malpractice. Altman [20] raised the question: "what should we think about a doctor who uses the wrong treatment, either willfully or through ignorance, or who uses the right treatment wrongly? " He answered that most people would agree that such behavior is unprofessional, arguably unethical and certainly unacceptable. Similarly, he concluded, that we should think about researchers who use the wrong techniques, use the right techniques wrongly, misinterpret their results, report their results selectively, cite the literature selectively, and draw unjustified conclusions. He added that numerous studies of the medical literature in both general and specialist journals, have shown that all of the above phenomena of violating research integrity or research misconduct are common, concluding that this is surely a scandal. [20]

4. The role of medical journals

Because of what Altman[20] said, medical journals, by providing credible information medium for the scientific community, constitute a crucial part of the research process. Information published in the *Uniform Requirements,* the most frequently cited Instructions to Authors, in the PubMed indexed medical journals include topics that are related to

research integrity besides those that are related to manuscript preparation. Copyrights, authorship, reference practice, publishing practice, financial disclosure, peer review, human subject research, animal research, correcting the literature, research misconduct were the ten primary topics investigated by Scheetz [21] in his study analyzing the degree to which integrity issues are addressed in *Instruction to Authors (IA)* of 41 medical journals. Scheetz [21] found that the above ten topics were found only in 7% of the journals and 58% of the *IA* contained four or fewer of these primary topics. He concluded that there is a lack of uniformity and frequency of primary topic categories and integrity measures. He added that editors and publishers are in a unique position to help cultivate a scientific culture that promotes research integrity through instruction they provide to authors and enhance the research cycle by educating their readers about research integrity. [21] Thus, managing and promoting the integrity of research should be the future goals for every Arab biomedical journal. Learning from the Croatian experience where the Croatian Medical Journal introduces, what it believes to be, the first Research Integrity Editor. Moreover, the Croatian Medical Journal intends to facilitate the development of an Office of Research Integrity, based on the ORI model, to develop regulations to define scientific misconduct, investigate, and develop administrative actions against those found to have committed scientific misconduct. [22]

5. The authorship credit and research integrity

Given the association between authorship credit and responsibility from one side and research misconduct and scientific fraud in the other side, we can not deal with one leaving the other.[23] A frequently encountered challenge in Arab world is the authorship credit and the disputes around such credit and authorship order. An existing situation, despite not scientifically-grounded by studies in our countries, leads to the emergence of either guest authors added to the list without fulfilling the criteria of authorship, or ghost authors who are deleted from the list albeit fulfilling such criteria. [23] Many people accept or confer gift authorship, detection is unlikely, and the rewards are obvious: tenure, promotion, research grants, and fame, especially in a society that measures worth by the weight of papers produced rather than their quality. [24] Authorship credit should be based on 1) substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; 2) drafting the article or revising it critically for important intellectual content; and 3) final approval of the version to be published. Authors should meet conditions 1, 2, and 3. Collection of data, technical help, general supervision of the research group or department chair, alone, does not justify authorship. The order of authorship on the byline should be a joint decision of the co-authors. All contributors who do not meet the criteria for authorship should be listed in an acknowledgments section. [25] COPE [26] prepared some guidelines which could help researchers to handle authorship disputes. They recommended three principles: 1) encourage a culture of ethical authorship where researchers should not simply follow local customs and practice but they need to be aware of the views of editors, 2) start discussing authorship when planning the study, so researchers have to raise the subject right from the start at a face to face meeting and continue to discuss ideas about authorship as the project evolves keeping a written record of discussions, and 3) decide authorship before starting each article as many authorship difficulties arise because of misplaced expectations and poor communication. Before starting to write the project, confirm in writing who will do what and when. Ideally this should be face to face and keep everyone informed of any changes with a written note. [26]

6. The pre and post- publication peer review process

Smith [27] stated that "the problem of peer review is that we have good evidence on its deficiencies and poor evidence on its benefits" [27] The medical journals could promote the quality of published articles and the effectiveness of their peer-review process by adopting many strategies. "Asking first" protocol by querying potential reviewers before sending manuscripts is an alternative protocol to "just send" where reviewers are allowed to opt out. Pitkin and Burmeister concluded in their study [28] that assenting "ask first" referees completed reviews faster. However, they found no indication that soliciting in advance affected review quality. [28] Schroter et al.[29] found that one full day of a face to face training package had only a slight impact on the quality of peer review in terms of quality of reviews and detection of deliberate major errors. However, the training did influence reviewers' recommendations to editors. Hence, they recommended that the value of longer interventions needs to be assisted.[29] Baxt et al. [30] found that peer-reviewers failed to identify two thirds of the major errors in a fictitious manuscript. Therefore, they concluded that the use of a preconceived manuscript into which purposeful errors are placed may be a viable approach to evaluate reviewer performance. [30]

Scientific discourse occurs in many forms among colleagues, at scientific meetings, during peer review and after publication. Such discourse is essential to interpreting studies and guiding future research. There are mainly two categories of letter to editor in medical journals; the critical letter which provides a forum for readers to comment about articles recently published in the journal and the research letter which reports concise research. [31,32] the critical letter is an essential part of post-publication peer review. [31] Many readers seem to assume that articles published in peer reviewed journals are scientifically sound, despite much evidence to the contrary. It is important, therefore, that misleading work be identified after publication. [33] Through the letters, scientific articles published are subject to continuing scrutiny. Letters also document discussions and debate. Moreover, it helps make a journal accountable to the scientific community [34] Therefore, journals welcome and encourage the submission of letters to editors. [31,35] Mayberry stated that any editor is glad to know that his or her journal is being read and that articles have prompted a response. [36]

What can research units further do to foster the link?

The poor linkage between research and policy results in directing only 10% of research and development spending at the health problems that cause 90% of the world's disease burden. [9] Therefore, research units and departments in the Arab Ministries of Health should assist with the formulation of assessment tools that reveal the full picture of the way research is used in policy making. Research units should first draw on the research policies in their countries. Research policy comprising goals to be achieved, strategies to be taken and health and health related priorities should be developed by and implemented in research

institutions. Then, units have to set defined research policies' goals as disseminating the research culture, capacity building of health workers and researchers, and evidence-based policy and planning. Such goals would facilitate implementing the research strategies and knowing the strengths, weaknesses, opportunities and threats in any health research system (HRS). Defining a sound health research system would censor how responsible the research is conducted; the aforementioned point, and what are the incentives or disincentives influencing research finding utilization. HRS functions are stewardship, financing, building resources, and conducting studies. One of the main elements that distinguish a HRS is the attempt to develop mechanisms and networks to facilitate the greater use of health research. Researchers, by conceptualizing the utilization process, could definitely help in developing the interest in research-informed policy making and work on strengthening or fostering the research - policy link. [2,9]

The research units could adopt many research communication and dissemination strategies to facilitate the use of research findings. These strategies include: maximizing press and media exposure, widespread distribution of brochures and pamphlets, increasing the use of the internet and other electronic means of dissemination, publishing research papers, disseminating policy briefs, engaging with policy makers through policy debates, and holding open seminar presentations. [37]

Improving communication between different stakeholders

Policy decisions are not necessarily made based on a single study. On the other hand, a single research study can have multiple policy implications. Best use of the research results starts with ensuring relevance to the potential users. This requires research that fits within national priorities rather than externally imposed agenda. The various groups of people who are concerned by the issues being studied, the stakeholders, should be identified and become involved at various steps of the process of research planning, management and dissemination. Interaction among all the stakeholders needs to be intensive and take place at multiple overlapping stages of the research and decision making process. A common pitfall made by researchers in raising recommendations based on study findings, is not to involve all stakeholders. Researchers attempt to do this on their own belief that they are more neutral to the situation and will not bias the recommendations. The role of mediators is perhaps the most crucial component in fostering the linkage of research to policy. They could be researchers themselves, academic groups that support evidence-based decision-making, national research coordinating bodies, or international agencies.[8]

Troslte et al. [1] recommended improving communication between researchers and policy makers via training of both parties: assisting researchers to communicate their findings in an understandable and stimulating way, or synthesizing policy makers about the usefulness of research results as an input to decision making. They also recommended that research should be evaluated in terms of its cost and effectiveness before it is considered as the basis for a policy or program. However, this type of evaluation is still under-developed internationally. [1]

How to communicate research?

The Canadian Heath Service Research Foundation has a two-page guidance note on how to present and communicate research findings for policy makers. This principle has been used to good effect in departments and agencies in Canada, Australia, the USA, the UK and other countries. Known as the 1:3:25 method, it refers to the number of pages in:

- The summary in bulleted form (1 page)
- Executive Summary (3 pages)
- Full length report (a maximum of 25 pages). [7]

Knowledge translation

Knowledge Translation is the exchange, synthesis and ethically sound application of knowledge within a complex system of interactions among researchers and users, to accelerate the capture of the benefits of research for Canadians through improved health, more effective services and products, and a strengthened health care system." 38

It is time to extend the meaning of evidence, argues Dr. Dennis Willms (McMaster University, Hamilton, Ontario, Canada), beyond the results of traditional academic or scientific research to a broader definition encompassing experiential, intuitive, spiritual, practical and expert knowledge. Such a definition would facilitate the involvement of multiple stakeholders in a participatory process of dialogue and negotiation to arrive at a shared framework for understanding and seeking solutions to priority health problems. 39 This participatory process is a defining feature of what he calls translational research.

Translational research entails the systematic eliciting of, and building on, evidential and experiential stories from a wide range of stakeholders. The many actors engage in a process of structured reflection and action. Intentionally organized forums provide an opportunity for sharing understandings of the determinants of, and evidence for, a specific health problem, agreeing on a mutual language for framing these understandings and negotiating joint solutions. Referred to as "conceptual events" by Willms, these forums give equal time and voice to dissonant perspectives. They have the potential to form the basis for the design, dissemination, and evaluation of health interventions that are equitable, sustainable, culturally appropriate, and psychologically compelling. [39] Lomas [40] suggests three types of knowledge translation activities:

- Diffusion: These include activities that are passive and where the actual "translation" effect is relatively unplanned. The objective is simply to promote awareness. Examples include journal or newsletter publications, information on a website, or in the mass media.
- Dissemination: Interventions here include more intentional strategies, such as direct mailing of results to intended audiences, workshops, and conferences. The goal is both awareness creation and attitude change.
- Implementation: Here the interventions are even more active, with the intent of adding behavior change to awareness and attitude change. Efforts are directed to systematically identifying and overcoming barriers. Examples include specific meetings with opinion leaders, audit and feedback or reminder procedures, and administrative or economic interventions. [40]

Effective dissemination

A number of important components of effective research dissemination are identified, including: [41-43]

1. distillation of research findings,
2. the use of plain and clear language rather than academic style (implying a reduced methodological and theoretical content),
3. using a range of formats appropriately tailored to different audiences,
4. using multiple media channels;
5. paying attention to timing.
6. communicating research results differently to each health policy audience according to the type of the health policy, decision, or program being influenced. There are few examples of systematic reviews of research regarding the effectiveness of diffusion, dissemination and implementation strategies on changing the behavior of policy decision makers. One such review was created to provide guidance to health technology assessment programs in Europe [44] . The project's sub-group on Dissemination and Impact, after reviewing the available literature, concluded that personal contact with policy staff was more effective than distributing printed material. When printed reports are used, they should be short and should be written from the perspective of policy makers, specifically addressing questions that need answering. The style of presentation should be clear and compelling. These insights are now quite generally known, and used in the preparation and presentation of policy briefs. The role of health services research in public policy making have been examined by Lavis and colleagues. [45]

Knowledge creep

The publication of the Netherlands Development Assistance Research Council [46] entitled Utilization of Research for Development Cooperation: Linking Knowledge Production to Development Policy and Practice, consists of a collection of papers that draw on the concept of 'knowledge creep', i.e. the notion that research does not necessarily have a direct impact on specific policies or decisions (as proposed in a linear model), but rather has an indirect influence on the policy environment – and hence on policy processes – through gradually introducing new perceptions and understanding. Research has an impact on the policy agenda through interactive, gradual processes and networks. A second publication also by RAWOO [47] repeats the agenda-setting point, arguing that support to capacity development should not just include research activities but also capacities related to agenda-setting ability and policy dialogue.

Let us think business:

If there is an actual depression in marketing our research to policy makers in the Arab world, let us think business. First, we have to start with "customer analysis" where we should analyze the nature of policy makers, their educational background, how they perceive policy making process, their decision making capabilities, what factors they consider in policy making and what are their sources of information, the type of decisions made by them and examples of the recent policies made. Then, we have to know "the research share" in the policy making process i.e. to what extent research findings share in policy formulation. PEST analysis used in marketing could be applied in our situation where the Political, Economic, Socio-cultural and Technological factors should be analyzed.

Then, let us think about the marketing variables, which are known as the 4Ps: product development, pricing or economic affordability, promotion of the product, and place of the product or physical accessibility to it. [(48)] It was mentioned above about the need for ensuring the quality of the research product and responsible conduct of research which would lead to gaining the trust of our customers. As regards the price, our policy makers usually consider research as an expensive product. Unfortunately, we don't know much in our Arab world about the costs of studying a specific health domain and what would be the revenue from it. Therefore, to penetrate the market of policy making, we have to adopt the "demand based method" of pricing our research findings, where we have to respect the other competitive "cheap and fast" sources of information used by policy makers. When the demand on our research is low the price should go down. By that, I mean to start with the short term operational- based research with low integrated funding instead of the long term research of huge funding and slow outcomes. Moreover, in business, intermediaries play an important role in increasing efficiency and reducing costs. There are several different types of intermediary who come together to create different kinds of distribution channels between manufacturer and consumer. Similarly, knowledge brokering is a two-way process that aims to encourage policy makers to become more responsive to research findings and to stimulate researchers to conduct policy relevant research and to translate their findings to be meaningful to policy makers. [(49)]

Promotion of research has its different strategies including sensitizing our target from policy makers and the public to research findings, and training them to use these findings and increase their demands on it. Incentives and careers to the research producers are also crucial components of such promotion. The deliberate, planned and sustained effort of researchers and research brokers to institute and maintain mutual understanding between different research bodies and their target audience from policy makers and the public is a part of research promotion.

Similarly to the SWOT analysis in business, Innvaer [(50)] and Aaserud [(51)] have made attempts to isolate facilitators and barriers to the use of research evidence in policy-making. These points would help to guide researchers in making their research more policy-maker-friendly. Examples of the facilitators to use research are the good quality of research, timeliness and relevance of research, research with a conclusive summary and clear recommendations, community demand on research, good communication between researchers and policy makers and establishing channels with public authorities, and involvement of international and/or professional organizations. Barriers are the opposite of the aforementioned factors plus lack of human or non human resources and financial constraints. [(50,51)]

To conclude, to foster the link and communication between researchers and policy makers, we have to strengthen researchers' communication skills; to aim for close collaboration between researchers and policy-makers; to construct an appropriate platform from which to communicate; and to strengthen the

institutional capacity of policy departments to take up research.

Table 1: Some factors that promoted or impeded exchanges between researchers and policy makers [1]

Category	Promoting factors	Impediments
Content	Research quality	Vocabulary of researchers and decision makers is different
	Agreement of both researchers and policy makers to give more attentions to biomedical than social	
	Specificity, concreteness and cost- effectiveness	
Actors	Both researchers and policy makers identify priority together	Lack of technical background of policy makers or media
	International support	Policy makers value experience more than information
	Official research organizations e.g. research department	Agenda brought to bear by non academic interest group
Process	Informal ties	Difficulty in selling research questions and results to policy makers
	Balanced interests	
	Formal communications	
Context	Political stability	Excessive centralization
	Homogeneity of research community	Hierarchal management of information
		Restricted economic resources

Table 2. Topics by cluster to be included in Guideline for conduct of research 19

Cluster	Topics
Data Management	Study design, analysis, data notebooks, data retention, ownership, sharing and access
Publication and data dissemination	Publication practices, Authorship, Peer review
Investigators' roles and responsibility	Principle investigator role and responsibility, Mentoring
Legal issues	Conflict of interests, Intellectual property

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Prevalence of Metabolic Syndrome in Primary Health Care - An Area Based Study

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Key Words: Metabolic Syndrome, prevalence, Kuwait, Primary care.

Abstract

Objective: The aim of our study was to estimate the prevalence of metabolic syndrome among selected Kuwaiti patients in Ahmadi & Mubarak Al-Kabir area attending a primary health care clinic.

Subjects and Methods: A cross-sectional study of consecutive Kuwaiti participants who attended the Qurain special clinic by call, aged between 20-60 years during March, April, May, June 2006. Four-hundred and ninety five participants 214 (43.2%) males and 281(56.7%) females were interviewed in detail about their social, demographic, socioeconomic, life style and health diseases status. This was done using the WHO stepwise approach to surveillance of non communicable diseases step s, after translation to Arabic. Diagnosis of MS was based on NCEP-ATP 111 criteria syndrome was 194 (39.19%). 106 (37.7%) of them were females and 88(41.1%) males. Significantly MS increased by age. MS criteria were significantly commoner in men than women for increased waist circumference and increased triglyceride and diastolic BP.

Conclusion: The prevalence of metabolic syndrome is high among Kuwaiti participants attending a primary health clinic in Kuwait. It is recommended that doctors in primary care settings should be aware of the five risk factors related to metabolic syndrome with a view to offering appropriate treatment.

Results: The total number who met the ATP111 guidelines for diagnosis of metabolic

Introduction

The metabolic syndrome is a common disorder characterized by central obesity, impaired glucose tolerance, hypertension and atherogenic dyslipidemia (including the combination of hypertriglyceridemia, low levels of high-density lipoprotein cholesterol, and a preponderance of small, dense low-density lipoprotein particles.[3,4,30]

Metabolic syndrome was described first in 1988 [10]. In recent years MS has attracted muchattention and definitions of metabolic syndrome have been proposed by various medical societies.

Recently, the third report of the National Cholesterol Education Programme Adult Treatment Panel 111(NCEP-ATP 111) drew attention to the importance of metabolic syndrome and provides a working definition of this syndrome. [2, 13, 14, 20, 26 and 30].

The diagnosis of metabolic syndrome is based upon the demonstration of at least three of the following five criteria to make a diagnosis as shown in Table 1[9 26, 30].

A recent report from the independent market analyst, Datamonitor, revealed that 115 million people in the US, Japan, France, Germany, Italy, Spain and the UK suffer from metabolic syndrome .It is a global epidemic that is growing fast due to increasing obesity and sedentary life styles.

The metabolic syndrome is a constellation of interrelated risk factors of metabolic origin - metabolic risk factors that appear to directly promote the development of atherosclerotic cardiovascular disease[1,2,4,5,6,9,10,15,17,20,23,26,30,33] and development of type 2 diabetes mellitus [2, 6, 20,23,33] as well as increased mortality from cardiovascular disease and all its causes [2, 5, 14, and 21, 30].

Although ATP 111 did not make any single risk factor (e.g. abdominal obesity) a requirement for diagnosis, it nonetheless espoused the position that abdominal obesity is an important underlying risk factor for the syndrome [6].

The growth in prevalence of the metabolic syndrome parallels the dramatic rise in the prevalence of obesity. [30]

Subjects & Methods

A population-based cross-sectional study was conducted during March, April, May and June 2006 from two primary health areas (Ahmadi and Mubarak Al-kabir area) in a primary health centre Qurain clinic.

A stratified sampling method was used to select the participants of a total 495 (214 males and 281 females)' of Kuwaiti nationality.

The participants were invited by Telephone call; all participants gave informed consent at baseline and answered a structural

questionnaire by using WHO stepwise approach to surveillance of non communicable diseases steps after translation to Arabic. The questionnaire contained items on social, demographic data (birth date and sex), lifestyle (smoking, alcohol consumption, physical activity), socioeconomic status (education level, occupation) self reported health conditions (disease status as hypertension, diabetes, cardiovascular diseases, cancer) and family history of disease. Examinations were performed including weight, height and waist circumference while the participant was lightly clothed.

Blood pressure was measured 3 times after the subject had been seated for ≥ 5 minutes, and the mean of the last 2 readings was used for analysis.

All subjects were asked to fast overnight for ≥ 8 hours before blood specimen collection. Venous blood was collected without anticoagulant in vacutainer tubes. Fasting glucose, cholesterol and triglyceride and all lab tests were done in Amiri hospital using Synchron LX 20 clinical systems.

According to NCEP ATP criteria, a participant has metabolic syndrome if he or she has three or more of the following criteria: [4, 8, and 21]

1. High blood pressure: ≥ 130\85 mmHg
2. Hypertriglyceridemia: ≥ 150mg\dl (≥1.70 mmol\l
3. Low HDL cholesterol : < 40 mg\dl (<1.04mmol\l) in men and <50 mg\dl (<1.30 mmol\l) in women.
4. Abdominal obesity: waist circumference >102cm in men and >88cm in women
5. High fasting glucose: ≥110 mg\dl (≥6.1)

The data were analyzed using the Statistical Package of Social Study SPSS version12. The p value was derived using the Chi-square test.

Results

Of the 495 participants recruited into the study, 194 (39.19%) met the ATP111 guidelines for diagnosis of metabolic syndrome as shown in Table 1. The prevalence of metabolic syndrome increased by age among different age groups as shown in Table 4.The prevalence of MS was 11.9% for those aged 20-29, 27.4% for those aged 30-39, 50.9% for those aged 40-49 and 69% for those aged 55-60, and the difference between the age group is statistically significant (p< 0.000).

The prevalence of patients with and without metabolic syndrome by gender is shown in Table 3. The prevalence of metabolic syndrome differed little among men and women (p< 0.192), which are not statistically significant. The prevalence of each of the five ATP 111 criteria for diagnosis of metabolic syndrome is shown in Table 2.

In our study the criteria with the highest prevalence was low HDL-c (75.5%) of the screened population while the lowest was that of impaired fasting blood sugar (23.03%). Raised plasma TG was found in 24.8%, increased waist circumference was found in 52.4%, and high BP was found in 39.4%.The difference between males and females for increased waist circumference and increased triglyceride were statistically significant (p<0.05) while the difference between genders for the remaining criteria was not statistically significant as shown in Table 2. Diastolic BP was statistically more significant than systolic BP as shown in Table 6.

Discussion

A survey of 495 Kuwaiti citizens ofAhmdi &Mubarak Al-kabir area attending Qurain special clinic by call, aged between 20 and 60 years showed that the prevalence of metabolic syndrome was relatively high. The prevalence of metabolic syndrome is 194 (39.19%) in this study, which was remarkably high, by using ATP 111 criteria for analysis.

Our data showed a significant relationship between age and metabolic syndrome (df =15,p value= 0.000). This result is consistent with other authors in other studies {7,12,19,20,22, ,24}. Also our study showed that metabolic syndrome increases with age {2, 8, 18, 30, and 31}. There was no significant difference in the prevalence of metabolic syndrome by sex (df = 5,p value 0.192). This result is consistent with other authors in other studies {2,29} and different to yet other studies which showed significant relationship between gender and metabolic syndrome [32]: men had higher incidence than women {8,11,19,28,30}. Women had a higher incidence than men {16, 18, 20, 24, and 27} in our study.This study has certain limitations. This is an area-based study conducted in two health districts. The result of this study may therefore be stronger and more significant if it included several additional health districts of Kuwait.

Conclusion

The increased prevalence of metabolic syndrome is likely to lead to future increases in cardiovascular disease and Diabetes.

It is important to identify and follow subjects with MS, even in apparently healthy populations, to enable early disease management.

People indicate the need to focus attention on public health strategies that target adolescents and young adults to reduce the burden of the syndrome in the future. It also means clinical strategies are needed to identify and provide interventions for the substantial number of persons already affected by the syndrome.

Education and training will be critical to ensure that health care providers have the knowledge and the skills necessary to properly treat patients with the metabolic syndrome.

Table 1. Criteria for diagnosing metabolic syndrome (three or more of the risk factors) according to the National Cholesterol Educational Program's ATP 111 Criteria {3, 4}

Risk factor	Defining level
Abdominal obesity	Waist circumference
Men	>102 cm
Women	>88 cm
TG	≥ 1.70 mmol\l (150mg/dl)
HDL-C	
Men	< 1.04mmol\l (40 mg/dl)
Women	<1.30(50 mg/dl)
Blood Pressure	≥130/85
Fasting Blood glucose	≥ 6.11mmol\l (110 mg/dl)

Table 2. Prevalence of each of the ATP 111 criteria for diagnosis of metabolic syndrome among the screened population (n=495)

Criteria	sex		Total	P value
	F	M		
Impaired FBS				
0	218	163	381	
+	63	51	114	
Total	281	214	495	0.712
Increased waist circumference				
0	106	124	230	
+	164	90	254	
Total	270*	214	484	0.000
Elevated plasma TG				
0	223	149	372	
+	58	65	123	
Total	281	214	495	0.013
Reduced HDL				
0	67	54	121	
+	214	160	374	
Total	281	214	495	0.721
Elevated Bp				
0	177	122	299	
+	103	92	195	
Total	280**	214	494	0.162

*11 pregnant ladies excluded,** 1 lady refused to check

Table 3. Prevalence of each of the ATP111 criteria for diagnosis of metabolic syndrome by sex:

Criteria		Sex		Total	P value
		F	M		
Criteria	No	37	21	58	
	+	66	61	127	
	++	72	44	116	
	+++	52	52	104	
	++++	34	27	61	
	+++++	20	9	29	
Total		281	214	495	0.192

Table 4. Prevalence of each of the ATP111 criteria for diagnosis of metabolic syndrome by age groups:

Age gp	Criteria						Total	P value
	No	+	++	+++	++++	+++++		
20-	33	65	20	11	5	0	134	
30-	11	35	28	17	11	0	102	
40-	11	20	47	53	18	10	159	
‘’50-60	3	7	21	23	27	19	100	
Total	58	127	116	104	61	29	495	0.000

Table 5. Prevalence of each of the ATP111 criteria for diagnosis of metabolic syndrome by age-sex groups:

Age-sex gp	Criteria						Total	P value
	No	+	++	+++	++++	+++++		
200	22	34	12	4	1	0	73	
201	11	31	8	7	4	0	61	
300	6	19	18	8	6	0	57	
301	5	16	10	9	5	0	45	
400	6	11	29	26	11	8	91	
401	5	9	18	27	7	2	68	
500	3	2	13	14	16	12	60	
501	0	5	8	9	11	7	40	
Total	58	127	116	104	61	29	495	0.000

Table 6. Prevalence of each of Bp of the ATP 111 criteria for diagnosis of metabolic syndrome among the screened population (n=494)

		Sex		Total	P value
		F	M		
Sys	o	182	137	319	
	+	98	77	175	
Total		280	214	494	0.821
Dias	o	216	148	364	
	+	64	66	130	
Total		280	214	494	0.046

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Diabetic Foot: Correlation Between Clinical Abnormalities and Electrophysiological Studies

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Key words: diabetes, foot, ulcer, and electrophysiological studies.

Abstract

Background: Diabetic foot ulceration is serious and with expensive complications with considerable morbidity that affects up to 15% of diabetic patients during their lifetime and 80-85% of amputations are preceded by foot ulcers. The aim of this work is to study the correlation between severity of clinical abnormalities and electrophysiological studies in diabetic foot ulcers.

Patients and Methods: This was a cross sectional study of patients with diabetic foot ulcers seen in 2 hospitals in Basrah (Al-Faiha General and Basrah Teaching) from October 2003 to July 2004. All patients had type 2 diabetes mellitus, and there were 44 patients in total. The same examiner, according to general practice, did quantitative assessment of clinical findings. Nerve conduction studies were performed using standard protocols. Nerve conduction abnormalities were classified into normal and abnormal according to the common peroneal nerve conduction of each leg separately.

Results The sensitivity of numbness, burning feeling, pricking feeling, and symptoms worse at night was 84.6%, 69.2%, 61.5%, and 51.5% respectively. While sensitivity of decreased pin prick sensation, absent vibration, absent ankle jerk, decreased temperature sensations, and absent position sense was 100%, 87.2%, 71.8%, 56.5%, and 12.8% respectively. Sensitivity of combined clinical symptoms was 66.6%, with specificity of 40%, and predictive value of 89.6% while that of clinical signs 48.7% and 60% respectively and predictive value of 90.4 %. There was no significant difference in severity of electrophysiological abnormalities in the affected and non-affected feet.

Conclusion: Clinical findings correlated with the severity of electrophysiological changes in patients with diabetic foot ulcers.

Introduction

Neuropathy is present in 80% of patients with diabetic foot ulcers; it promotes ulcer formation by decreasing pain sensation and perception of pressure, by causing muscle imbalance that can lead to anatomic deformities, and by impairing the microcirculation and the integrity of the skin.[1-5] Even in the face of non-obstructed vessels, impaired microvascular reactivity diminishes blood supply to the ulcerated areas.

About 20% of diabetic patients with foot ulcers will primarily have inadequate arterial blood flow, about 50% will primarily have diabetic neuropathy, and about 30% will be afflicted with both conditions.[6]

Diabetic foot ulceration is a serious and expensive complication with considerable morbidity that affects up to 15% of diabetic patients during their lifetime, and 80-85% of amputations are preceded by non-healing foot ulcers.[7-10]

There is increasing evidence that measures of neuropathy, such as electrophysiology (including motor nerve conduction velocity) and quantitative tests, are predictors of not only end points, including foot ulceration, but also of mortality.11

In Iraq, diabetic foot ulcers were reported in 17% of diabetics in a small series from Baghdad.[12]

The aim of this work is to study the correlation between severity of clinical abnormalities and electrophysiological studies in diabetic foot ulcer.

Patients and Methods

This was a cross sectional study of patients with diabetic foot ulcer seen in 2 hospitals in Basrah (Al-Faiha general and Basrah teaching) from October 2003 to July 2004. Patients from inpatient's clinic were included. All patients had type 2 diabetes mellitus (DM); there were 44 patients with diabetic foot ulcer.

Definitions:

DM and degree of control was considered according to the American Diabetic Association (ADA) recommendations in 2002.13 For blood pressure, the average of second and third blood pressure measurements in the office were considered. Two blood pressure recordings were obtained from the right arm of patients in a sitting position after 30 minutes of rest at 5-minute intervals, and their mean value was calculated. Hypertension was considered if blood pressure was equal to 140/90 mmHg or above. Nephropathy was diagnosed on the basis of persistent frank proteinuria without erythrocytes or white blood cells in urine. Microalbuminuria detection was not feasible. Ophthalmologists diagnosed retinopathy.

Body mass index was calculated according to the formula weight (kg)/ht2 (m2).14 The women were non pregnant. Autonomic function tests were not done. Diabetic foot ulcer was defined as any full-thickness skin lesion distal to the ankle that required treatment in hospital, excluding minor abrasions and or blisters; presence of any other cause of diffuse peripheral

neuropathy (malignancy, renal failure alcohol abuse, drug abuse, anemia, known vitamin B12 deficiency, or untreated hypothyroidism). Vibration sensation was measured on the plantar hallux using a 128-Hz tuning fork, and was graded as absent if the subject reported no vibration while the examiner could still sense vibration. Achilles tendon reflex was elicited with the subject in supine position. Neuropathy screening instruction questionnaire was done for all (appendix –1-).15

Quantitative assessment of clinical findings was done by the same examiner according to general practice (appendix –2-).1 Nerve conduction studies were performed using standard protocols.16 Nerve conduction abnormalities were classified into normal and abnormal according to the common peroneal nerve conduction of each leg separately (normal >44.4 m/second, mild 40-44.3m/second, moderate 36-39.9m/second,and severe <36 m/second). Using an electrophysiological study as a gold standard for the neuropathy, we calculate measures of validity, namely sensitivity and specificity. The results were expressed as percentages. For statistical analysis, a Chi –square test was used as appropriate. Level of significance was set to be <0.05 throughout analysis.

Results

Major characteristics of patients are present in table I and feet findings in table II. Mean age was 58.7 ±8.7 years, and 54% of the study sample were females. Most ohad low qualification levels and average BMI. The most common treatment was oral hypoglycemia in 63.6 %. About two thirds of patients had non-optimal control of diabetes. Hypertension was seen in 38.6 %. Most were from low social classes. Past history of diabetic foot was seen in 56.8%. Fifty percent of ulcers were Wagner grade one and Pes cavus was seen in 50%.

The sensitivity of numbness, burning feeling, pricking feeling, and symptoms worse at night was 84.6%, 69.2%, 61.5%, and 51.5% respectively (table III). While sensitivity of decreased pin-prick sensation, absent vibration, absent ankle jerk, decreased temperature sensations, and absent position sense was 100%, 87.2%, 71.8%, 56.5%, and 12.8% respectively (table III). All patients had abnormal motor nerve conduction velocities (table IV).

Sensitivity of combined clinical symptoms was 66.6%, with specificity of 40%, and predictive value of 89.6%; while that of clinical signs was 48.7% and 60% respectively and predictive value of 90.4 % (table IV).

There was no significant difference in severity of electrophysiological abnormalities in the affected and non-affected foot (table V).

28.2 two percent of those with optimal diabetes control had severe electrophysiological study changes, versus 71.7% in those with non-optimal control (table VI).

Discussion

It is generally agreed that diabetic neuropathy should not be diagnosed on the basis of one symptom, sign, or test alone: a minimum of two abnormalities (from symptoms, signs, nerve conduction abnormalities, quantitative sensory tests, or quantitative autonomic tests) is recommended by Dyck.[17] In our study, the sensitivity of clinical symptoms in predicting severe electrophysiological changes in patients with diabetic foot ulcer was 66.6% and that of clinical signs 48.7%. In some other studies the prevalence of diabetic neuropathy has been estimated to be as high as 62% of diabetics based on subjective complaints, 55% by signs and 100% by nerve conduction studies.[18]

Of our patients 22.7% were smokers, 38.6% hypertensive, 63.6 % had non-optimal control of diabetes and most whad low education levels. In univariate analyses, diabetic foot problems were characterized by older age, male preponderance, longer duration of diabetes, smoking, poorer glycemic control, more insulin users, hypertension, hyperlipidemia, higher diastolic and systolic blood pressure, lower education level, and living in rural areas.[19]

Retinopathy was seen in 63.6%, nephropathy in 45.4%, and absent pulsation of the feet in 13.6%. Only 34.1% used insulin with or without oral hyperglycemic agents. Theories of ulcer development other than the roles for neuropathy, includes diminished vascular perfusion, foot deformity and higher foot pressure, diabetes severity reflected by type of treatment and pre-existing diabetic complications.20

This study showed muscle atrophy in 75%, with pes cavus in 50%.

Motor neuropathy is commonly believed to lead to weakness in the intrinsic muscles of the foot, thus upsetting the delicate balance between flexors and extensors of the toes. Atrophy of the small muscles responsible for metatarsophalangeal plantar flexion is thought to lead to the development of hammer toes, claw toes, prominent metatarsal heads, and pes cavus.21

Decreased pinprick sensation was observed in all patients (100%), absent ankle reflex in 70.4% and decreased vibration in 84.1% in this study. In prospective studies, the three main independent predictors for foot ulceration has been shown to be absent Achilles tendon reflex, impaired monofilament pressure sensation, and impaired vibration sensation.22 Most of our patients have a low educational level, nevertheless, high incidence of foot ulceration has been reported in a population of diabetic patients with established peripheral neuropathy, despite the patients receiving a high level of education. 23

In Conclusion clinical findings correlated with the severity of electrophysiological changes in patients with diabetic foot ulcers.

Table 1. Patient characteristics

Variables	No.(%)
No.	44(100)
Age (years) mean±SD (range)	58.7 ±8.7(31-75)
Sex male	20(45.4)
Females	24(54)
Qualification (years of school achievement)	3.6 ±3.7
Duration of diabetes mellitus mean±SD	12.25 ±7.8
BMI mean±SD	24.1±4.12
Smoker	10(22.7)
Drinker of alcohol (social)	3(6.8)
Lines of treatment	
Diet alone	1(2.2)
*Oral hypoglycemic agents	28(63.6)
**Insulin with oral hypoglycemic drugs	7(15.9)
Insulin alone	8(18.2)
Degree of control of DM	
Poor	23(52.3)
Acceptable	8(18.2)
Optimal	13(29.5)
Associated vascular disease	
Hypertension	17(38.6)
CVA	5(11.4)
HF	4(9.1)
IHD	5(11.4)
Social class	
Low	36(81.8)
Intermediate	7(15.9)
High	1(2.3)
Others	
Nephropathy	20(45.4)
***Retinopathy	28(63.6)
Past history of diabetic foot	25(56.8)

*2 of them on combined sulfonylurea and metformin
**1 of them on combined sulfonylurea, metformin
***3 patients had mature cataract and 2 glaucoma

Table 2. Foot examination.

		No.(%)
Side of foot ulcer	Right	16(36.5)
	Left	21(47.7)
	Both	7(15.9)
Site of the ulcers	Big toe	18(40.9)
	Other toes	12(27.3)
	Big toe and other toe	5(11.3)
	Foot and toe	2(4.5)
	Heel	1(2.3)
	Malleolus	1(2.3)
No. of ulcers	Single	35(79.5)
	Multiple	9(20.4)
Wagner grade	1	22(50)
	2	12(27.3)
	3	6(13.6)
	4	4(9.1)
	5	0(0.0)
Nails changes		24(54.5)
Fissures in the skin		18(40.9)
Callosities		9(20.4)
Pes cavus		22(50)
Muscle wasting		35(79.5)
*Absents pulsation		6(13.6)
Dermopathy		16(36.3)

*Absents dorsalis pedis and/or posterior tibial artery.

Table 3. Clinical finding in patients with diabetic foot.

Symptoms	Clinical finding	No.(%)	Sensitivity %	Specificity %	Positive predictive value %
	Numbness	38(86.3)	84.6	0.0	86.8
	Burning feet	32(72.7)	69.2	20	87
	Pricking feeling	27(61.3)	61.5	20	85.7
	Symptoms worse at night	23(52.2)	51.2	40	86.9
Signs	Decrease pin prick sensation	44(100)	100	0.0	88.6
	Absent vibration	37(84.1)	87.2	0.0	87.1
	Ankle jerk absent	31(70.4)	71.7	60	90.3
	Decrease temperature sensation	24 (54.5)	56.4	60	91.6
	Absent position sense	6(13.6)	12.8	80	83.3

Table 4. Correlation between clinical finding and electrophysiological study.

Clinical finding		Electrophysiological study						
		Severe	Mode-rate	Mild	Total	Sensi-tivity %	Specifi-city %	Positive predictive value %
Clinical symptoms	Severe	26	3	0	29	66.6	40	89.6
	Moderate	7	0	1	8			
	Mild	6	1	0	7			
Total		39	4	1	44			
Clinical signs	Severe	19	2	0	21	48.7	60	90.4
	Moderate	15	1	0	16			
	Mild	5	1	1	7			
Total		39	4	1	44			

Table 5. Correlation between electrophysiological study in the affected and non-affected foot. Each lower limb was considered a subject in the analysis.

Electrophysiological study	Affected foot No. (%)	Non-affected foot No. (%)	P value
Severe	*39(88.6)	35(79.5)	***NS
Moderate	4(9)	5(11.3)	
Mild	1(2.2)	4(9)	
**Non- severe total	5(11.3)	9(20.4)	
Total	44(100)	44(100)	

*7 patients has both foot affected and we took foot with higher Wagner grade as the affected.
**Non-severe includes moderate and mild.
***NS denote non-significant

Table 6. Correlation between severity of electrophysiological study and degree of diabetic control.

Electrophysiological study	Optimal No. (%)	Acceptable No.	Poor	*Non-optimal No. (%)	Total
Severe	11(28.2)	6	22	28(71.7)	39
Moderate	1	2	1	3	4
Mild	1	0.0	0.0	0	1
Non-severe total	2	2	1	3	5
Total	13	8	23	31	44

*Non-optimal includes acceptable and poor control
P value =NS between optimal and non-optimal

Appendix1. Neuropathy screening instruction questionnaire (yes or no)15

Are your leg or feet numb? **( )**
Do you ever have any burning pain in your legs and/or feet? **( )**
Are you feet too sensitive to touch? **( )**
Do you get muscle cramp in your legs and /or feet? **( )**
Any pricking feeling in your legs and/or feet? **( )**
Does it hurt when the bed covers touch your skin?( )
Can you tell in the bathroom the cold from hot water? ( )
Any seen open sores in the feet? ( )
Any doctor told patients that he is having diabetic neuropathy? **( )**
Do you feel weak all over most of time? **( )**
Are your symptoms worse at night? **( )**
Do your legs hurt when you walk? **( )**
Are you able to sense your feet hen you walk? **( )**
Is the skin on your feet so dry that it cracks open? ( )
Have you ever had amputation? ( )

Appendix2. Quantitative assessment of symptoms:1

- what is the sensation felt – burning, numbness, or tingling (2 points); fatigue, cramping, or aching (1 point). Maximum is 2 points.
- What is the location of symptoms – feet (2 points); calves (1 point); elsewhere (no points). Maximum is 2 points.
- Have the symptoms ever awaken you at night – yes (1 point).
- What is the timing of symptoms – worse at night (2 points); present day and night (1 points); present only during the day (no points).

Maximum is 2 points.

• How are symptoms relieved – walking around (2 points); standing (1 point); sitting or lying or no relief (no points). Maximum is 2 points.
The total symptom score can then be determined:

- 0 to 2 - normal
- 3 to 4 - mild
- 5 to 6 - moderate
- 7 to 9 - severe

Quantitative assessment of physical findings:

- What is the Achilles tendon reflex – absent (2 points for each foot); present with reinforcement (1 point for each foot).
- What is the vibration sense – absent or reduced (1 point for each foot).
- What is the pin prick sensation – absent or reduced (1 point for each foot).
- What is the temperature sensation – reduced (1 point for each foot).

The neurologic signs score can then be determined:

- 0 to 2 – normal
- 3 to 5 – mild
- 6 to 8 – moderate
- 9 to 10 – severe

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Immunization Coverage Among Slum Children: A Case Study of Rajshahi City Corporation, Bangladesh

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Key words and phrases: Immunization coverage, Slum child, Logistic regression model and Expanded Program on Immunization (EPI).

Abstract

The study attempted to identify important effects of some selected variables in complete child immunization coverage. The data for the study were collected in 2006 from the slum areas of Rajshahi City Corporation, Bangladesh. With regard to immunization coverage for the children under age five who were still alive at the time of the survey, the figure for full immunization was higher (92.3%) in the higher ages (24+ months) than the age 12-23 months (89.5%). Application of logistic regression model suggests that demographic and socio-economic factors are associated with the chance of child immunization. Place of delivery and exposure to mass media has highly significant effects on child immunization. The results show that the partial immunization coverage among the children is gradually decreasing when the age of the child increases. Similarly, the prevalence of the under weight and obese among the children increased in spite of being fully immunized.

Introduction

Bangladesh, situated in South Asia, emerged as a unitary and independent country on December 16, 1971. It is a country of 1,47, 570 square kilometers and around 147 million people (World Population Data Sheet, 2006) with the highest population density (839 per km^2) in the world (U.S. Department of State, 2004). The people of Bangladesh are mostly poor and it is well known for its rapid population growth. Just over 25% of its total population lives in urban areas and the rest (75%) lives in rural areas (Slums of Urban Bangladesh: Mapping and Census, 2005). Life expectancy at birth is 61 years for male and 62 years for female (World Population Data Sheet, 2006).

The World Health Organization (WHO) launched the Expanded Program on Immunization (EPI) in 1974. The program focused on tackling major childhood diseases: measles, tuberculosis, pertussis (whooping-cough), diphtheria, tetanus and poliomyelitis, aimed at universal immunization of children against all the above- mentioned diseases by 1990. Under the EPI, a child is likely to receive one dose of BCG for protection against tuberculosis, three doses of DPT (diphtheria, pertussis and tetanus), three doses of OPV for poliomyelitis protection and one dose of measles vaccine by his/her first birthday.

Children are the future assets of a country. Women are the heart of development; they rear and bear the children. The study conducted in Ludhina slums has found that there is a significant relationship between education as well as poverty with the acceptance of complete immunization (Panda et al., 1993). De Partha and Bhattacharya (2002) have shown that those mothers, who have gone for prenatal care and delivery care after giving birth, are most likely to immunize their child. Different studies have shown that the adoption/practices of immunization of pregnant women and children is positively and significantly correlated with the educational status and income of the mothers/parents (Kaur and Narwal, 1988; Srivastava and Saksena, 1988; Viswnathan and Rohed, 1990). This is due to the linkage between education and income with awareness and knowledge of all types of vaccination and also motivation of the people (Roy et al., 1988).

A survey conducted in the slums of Indore provides evidence that access to essential services, such as delivery and immunization, is different across different categories of slums: complete immunization was 34%, 45% and 49% for the most vulnerable, moderately vulnerable and others, while the percentage of home deliveries were 69, 50 and 38 for those respectively (Environmental Health Project-India, 2004).

The EPI is considered a successful story in Bangladesh because of its remarkable progress during the past 20 years. Immunization was started in Bangladesh in 1979 with the partnership effort between the Government of Bangladesh and the Non Government Organizations (NGOs) under the active initiative of WHO and UNICEF to combat six vaccine

preventable diseases with the objective of reducing morbidity, mortality and disabilities occurring due to these diseases, by making free vaccination services available to all the eligible children. The EPI provides almost universal access to immunization services as measured by the percentage of children under the age of one receiving BCG, which has increased a mere 2% in 1985 to cover 95% during the year from 1994-2003. However, the percentage of children under the age of one receiving all doses of vaccine at the right time and interval has been maintained only between 50-63% during the same period due to high dropout rate and invalid doses and 64% of the 12-23 months old children were nationally fully immunized with valid doses of all antigens by 12 months of age (EPI Coverage Evaluation Survey, 2005). A study conducted in Bangladesh (Jamil, K Bhuiya A. et al., 1999) showed that children living in communities where outreach clinics were further than 2 miles away were 30% less likely to be immunized than children living in communities where outreach clinics were within 2 miles.

This research is important because it will investigate other research and creates a vast research field to improve programs on mother-child health and achieve 100% immunization coverage in Bangladesh. Therefore, the main aim and objective of this study is to identify the factors, which are associated with the immunization coverage.

Data and Methods

The data of this study were collected in 2006 from 8 different slums of 3 wards of Rajshahi City Corporation, Bangladesh. These data were collected through personal interview method from 700 married women in the childbearing ages (15-49 years) who had at least one child under five years of age at the time of interview, taking into consideration that the selection should be consistent with our objectives. The 700 households that were selected from 8 different slums of 3 wards are presented in the following table.

Name of Slums	Ward No.	Slum Population	Sample Size
Dharompur Nadirdhar	28	7260	300
Char Kazla Badurtola			
Dashmari Nadirdhar	29	7235	300
Khozapur Nadirdhar			
Satbaria Nadirdhar			
Shympur Nadirdhar			
Paschim Para Boodh Para	30	2135	100
Mohonpur			
Total			700

Various alternative statistical tools exist for analyzing the extent of immunization coverage over time. This paper reports the results from multivariate logistic regression estimation. Logistic regression models were used to determine the relative effects of various characteristics on child immunization coverage. The dependent variable used in this model is given below: Y=1, if the children are fully immunized (3 dose of Polio and DPT each, one dose of BCG and Measles) and Y=0, otherwise.

Independent variables used in the model are presented in Table 1.

Table 1. List of Independent Variables Used for Logistic Regression Analysis

Independent Variables	Type	Categories
Child's age at interview (months)	Categorical	0=0-23 1=24+
Birth order of the index child	Categorical	0=1 1=2+
Place of delivery	Categorical	0=Not institutional 1= Institutional
Mother's education	Categorical	0=Illiterate 1=Literate
Husband's occupation	Categorical	0=Labor 1=Business 2=Service
Family's monthly income	Categorical	0= $\leq$ 2000 1=2001-2500 2=2501+
Exposure to mass media*	Categorical	0=Not exposed 1= Exposed

Note: * Exposure to mass media (a composite index has been computed for this purpose, based upon two factors – whether she watches T.V. and listens to Radio every week).

Child Immunization in Rajshahi City Corporation (RCC)

According to the Expanded Program on Immunization a child who received BCG, Measles and three doses of DPT and Polio each, is considered as fully immunized. In Rajshahi City Corporation, 79.0 percent of children aged 12-23 months old are fully immunized with valid doses of all antigens by 12 months of age (EPI Coverage Evaluation Survey, 2005). This is also the highest valid fully immunized rate among the other City Corporations in Bangladesh. The antigen-specific valid coverage rate is 99.4 percent for BCG, 98.9 percent for OPV-1, 98.6 percent for OPV-2, 94.4 percent for OPV-3, 98.9 percent for DPT-1, 98.0 percent for DPT-2, 86.0 percent for DPT-3 and 86.1 percent for measles.

Ideal Immunization Schedule for the Infant

At 1/2 months	B.C.G. (injection) D.P.T.-1 (injection) O.P.V. -1(oral dose)
At 2 1/2 months	D.P.T.-1 (injection) O.P.V. -1(oral dose)
At 3 1/2 months	D.P.T.-1 (injection) O.P.V. -1(oral dose)
At 9 months	Measles (injection)
At 16-24 months	D.P.T. Booster (injection)

Source: National Immunization Mission, GOB.

Results and Discussions

In spite of various socio-economic and cultural constraints of immunization services Bangladesh has achieved mentionable success in immunization coverage (Sarker, 1998). Table 2 shows that with regard to immunization coverage for the children under age five who were still alive at the time of the survey, the figure for full immunization was higher (92.3%) in the higher ages (24+ months) than the age 12-23 months (89.5%).

Table 2 also shows the incidence of partial immunization was high (97.2%) for the child aged 0-11 months. The partial immunization is gradually decreasing when the age of the child increases. Table 2 also indicates that a mentionable number of the children (5.6%) were not being immunized at all.

Table 2. Percentage of the Children with Immunization Coverage, Bangladesh

Receiving Immunization	Children's Age at Interview (month)			
	0-11	12-23	24+	All Ages
Full	0%	89.5%	92.3%	86.9%
Partial	97.2%	3.9%	2.3%	7.6%
Not at All	2.8%	6.6%	5.4%	5.6%

Although a high under weight and obese prevalence (77.9%) was seen among the children (immunized and not immunized together) as compared to the not malnourished (22.1%), a marked difference is seen in the prevalence between these two groups of children (Table 3). Table 3 shows that among the immunized children, only 22.8% are not malnourished which is much lower than the under weight and obese children (77.2%). Again among the not immunized children, this figure is also approximately the same.

Table 3. Prevalence of Nutrition (having BMI 18.5-24.9) among Fully Immunized and not Immunized Children Aged 12-23 Months, Bangladesh 2006

Nutritional Status*	Vaccinated	Not Vaccinated	Total
Under Weight and Obese	125 (77.2%)	16 (84.2%)	141(77.9%)
Not Malnourished	37 (22.8%)	3 (15.8%)	40 (22.1%)
Total	162 (100%)	19 (100%)	181 (100%)

Note: * = Body Mass Index (BMI) of 18.5-24.5= Not Malnourished (Normal Weight) Body Mass Index (BMI) less and above 18.5-24.5=Under Weight and Obese respectively.

Logistic regression analysis can go some way towards identifying those variables, which are truly related to child immunization coverage. The category with the relative odds of 1.00 represents the reference category for that categorical variable. In this section, Table 4 presents the estimate of logistic coefficients, standard error of these estimates, Wald chi-square, significant probability and the relative odds calculated for each category of the categorical variables. Here four independent variables statistically and significantly affected immunization coverage. These variables were the place of delivery, mother's education, family's monthly income and exposure to mass media of the mothers.

The low odds ratio for the uptake of immunization at higher age of child indicates that the probability of being immunized of the children is low in the higher ages. Our results reveal that the child of age 24 months and above is 0.231 times less likely to be completely immunized than the child in age group 0-23. From this it may be concluded that the parents of the children do not properly follow the immunization schedules by EPI guidelines with the increase of age of child. From the results of logistic regression analysis, it appears that the high birth order has a negative effect on full immunization coverage of children relative to the reference category. The results found that the child of birth order 2+ is 0.987 times less likely to be fully immunized than the single birth order child. This clearly shows the negligence by the mother regarding child immunization at higher birth order.

Generally, it is expected that those mothers who are already familiar with different kinds of health services, the likelihood of immunizing their children is higher than those who are not familiar. In institutional delivery, the children are given the polio and BCG just after birth, along with a vaccination card recording the vaccination schedule. The mothers are advised to immunize their children according to the given schedule. In this study, it is seen that mothers who gave birth in an institution (hospital or other health center) has a positive significant effect on child immunization. Here the odds of immunizing their children are 1.038 times higher than those who did not go for institutional delivery (reference category). Education widens the mental horizon of people. An educated woman has better knowledge of the availability of different kinds of health services and their necessity than their illiterate counterparts. The study indicates that mother's education has a significant effect on immunizing their children. The literate mothers have the higher odds (1.035) of immunizing their children as opposed to the illiterate mothers. This may be due to the higher acceptability of preventive health services by the educated mothers.

Husband's occupation also exerts significant impact for complete immunizing of children. In this study we see that husband's occupation (business and service) plays a positive significant role in immunization of children. From table 4, it is seen that having a business occupation is 1.059 times and service is 1.107 times more likely for taking up full immunization of their children, than that of labor group. It is expected that the children belonging to a higher income household should experience higher practices of immunization. It is presumed that the per capita consumption of health boosting goods and services for the children in higher income household is more than the children in the lower income households. The result shows that the family's monthly income is another important factor that has positive and significant effect on child immunization. It indicates that the mothers having household monthly income TK. 2001-2500 is 1.318 times and monthly income TK. 2501+ is 1.235 times more likely to take full immunization of their children than the women having household's income $\leq$2000 per month (reference category).

Mass media like radio and T.V. being an informal channel, can play an important role in disseminating information about the availability of different mother and child health services and their usefulness, which may lead to increase the coverage of complete immunization. The regression co-efficient corresponding to exposure to mass media is calculated and the co-efficient is statistically significant. The result provides that the mothers who are exposed to any mass media, the likelihood of immunizing their children is more (2.732 times) as compared to the mothers who are not exposed at all.

Table 4. Logistic Regression Estimation for the Effect of Some Selected Characteristics with Immunization Coverage as the Dependent Variable, Bangladesh 2006

Characteristics	Coefficient (β)	S.E. of estimates	Wald	Significance	Odds Ratio [exp β]
Child's age at interview (months) 0-23 ®	-	-			1.000
24+	-1.463	0.238	37.725	0.629	0.231
Birth order of the index child 1®	-	-			1.000
2+	-0.013	0.248	0.003	0.959	0.987
Place of delivery Not institutional ®	-	-			1.000
Institutional	0.038***	0.239	0.0.25	0.000	1.038
Mother's education Illiterate ®	-	-			1.000
Literate	0.035**	0.259	0.018	0.042	1.035
Husband's occupation Labor ®	-	-	0.059	0.971	1.000
Business	0.057	0.383	0.022	0.882	1.059
Service	0.101	0.423	0.058	0.810	1.107
Family's monthly income ≤ 2000®	-	-	0.199		1.000
2001-2500	0.276**	1.109	0.062	0.016	1.318
2501+	0.211***	0.558	0.143	0.000	1.235
Exposure to mass media Not exposed ®	-	-			1.000
Exposed	1.005***	0.413	5.923	0.000	2.732
Constant	1.419	0.460	10.495	0.001	4.443

Note: ®= Reference category
***,**, and * indicate p<0.001 (highly significant),p<0.01 (significant) and p<0.05(less significant) respectively.

Conclusion & Policy Recommendations

This study indicates that though the percentage of immunization is very high yet a considerable percentage of children did not take any immunization in the slum areas of Rajshahi City Corporation. Out of all the selected variables that are included in the logistic regression analysis to build the model, place of delivery, mother's education, family's monthly income and exposure to mass media play the significant role in determining immunization coverage. The results show that complete immunization coverage was lower for children whose age is above 24 months and for children whose mother has more than one child. The children who were not being started on immunization according to the immunization schedules provided by EPI guidelines, may have a lower chance of being immunized at later stages and may show the negligence of the mother regarding child immunization at higher birth order. The analyses also indicated that the risks of complete child immunization were found to be considerably higher among the selected variables for those mothers who were exposed to mass media. Therefore, an effective policy and recommendations are needed to achieve 100% immunization coverage in particular, in Rajshahi City Corporation, Bangladesh. The specific recommendations are as follows:

i). Child immunization coverage may be increased by informing the parents about the dangerous effect of not properly following the immunization schedules provided by the EPI guidelines through various mass media like TV, radio, newspaper, billboard etc.

ii). Create awareness among mothers about the proper schedule of immunization and encourage them to go for immunization at correct age of child. This could be done through information, education and communication (IEC) campaigns.

iii). To encourage parents to have a small family. Therefore, it will increase immunization coverage among the children and the target to achieve 100% immunization coverage throughout the country level will succeed.

iv). Government and non-government organizations efforts during specified National Immunization Days of high dose capsule distribution program must be carried out.

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Vaccination Practices And Factors Influencing Expanded Programme Of Immunization In The Rural And Urban Set Up Of Peshawar.

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Key words: Expanded program of immunization, vaccination of infants, urban and rural area, Peshawar

Abstract

Objectives: to appreciate the vaccination practices and factors influencing expanded program of immunization in the rural and urban set up of Peshawar.

Methods: A cross sectional observational survey was conducted from December 2005 to September 2006. Khyber teaching hospital was assigned as urban setup where only respondents belonging to the city area were selected and interviewed. Women from Palusi village (rural area) were included as rural sampling in the present study. Relevant information was recorded from the respondents with the help of a pre-designed proforma.

Results: A total of 440 respondents including 280(63.63%) from urban and 160(36.37%) from rural areas were selected. Of the total sampling, 98.57% of the urban and 86.37% of the rural women had started vaccination of their infants. Of the urban sampling 67.14% and rural sampling 48.12% had fully immunized their children for polio, hepatitis B, diphtheria, pertussis, tuberculosis, measles and tetanus vaccination. Mother education level in urban and rural areas varies significantly and this has an impact on the EPI services. Maternal education levels were: illiterate (urban 54.64%, rural 78.75%), primary (25%, 11.87%), matriculate (11.78%, 6.25%) while only 1(0.71%) of urban and none in rural women had postgraduate qualifications. Father education was: illiterate (urban 21.78%, rural 39.37%), primary (32.85%, 24.37%), matriculate (16.85%, 16.25%), while postgraduate qualification (7.14%, 1.25%) recorded. Maternal occupation also influences the EPI program in both set ups. Maternal profession recorded was: house wife (urban 55.71%, rural 70.62%), skilled woman (25.71%, 13.75%), student (11.78%, 10%) and government servant (6.78%, 1.8%).

Conclusion: Starting immunization of infants in urban and rural areas is satisfactory but full immunization of infants is not as satisfactory especially in the rural setup and they are often missed in the repeated doses of vaccination. Maternal education and occupation are the main factors that strongly affect the immunization of children and EPI program goals.

Introduction

In Pakistan by year 2003, 82% of one-year-old children were immunized for tuberculosis, 67% for DPT3 (Diphtheria, tetanus and pneumonia), 69% for polio, and 61% for measles. Data for children immunized for hepatitis B vaccine is not available.[1] To improve awareness and knowledge of mothers regarding vaccine preventable diseases and the immunization status of children under five through health education messages, the Aga Khan University conducted a survey that concluded that the health education messages significantly increased the vaccination status of children under 5 in the intervention area.[2] A total of 5486 cases of poliomyelitis were reported in Pakistan between 1988 and 1993. In 1994, the country joined the international polio eradication program and has since conducted eight national polio campaigns during which oral polio vaccine was given to children at special community centers throughout Pakistan under the auspices of the Expanded Program on Immunization [3]. BCG vaccination has been routinely offered to infant Asian children since 1965. Routine BCG vaccination in infant Asians confers useful protection against the development of tuberculosis in childhood [4]. A study on the consequences of low coverage levels of a single dose of measles vaccine concluded that there is a dire need to increase the immunization coverage to reduce the rate of vaccine failure and achieve effective control of measles [5]. Another study shows Protein-energy malnutrition remains an important underlying cause of death among preschool children in Pakistan. Female illiteracy, poor household income and overcrowding and little attention towards immunizing their children are important risk factors for stunting. There is a prevalent belief that in rural Pakistan, parents pay attention to feeding male children at the cost of female children [6]. the present study was conducted to appreciate the vaccination practices and factors influencing an expanded program of immunization in the rural and urban set up of Peshawar.

Methods

A cross sectional observational survey was conducted from December 2005 to September 2006. Khyber teaching hospital was assigned as an urban setup where only respondents belonging to the city area were selected and interviewed. Women from Palusi village (rural area) were included as a rural sampling in the present study.

Inclusion criteria were all women who had at least one child less than two years of age. Exclusion criteria were all females with no children, unmarried women, freshly married, and infertile women.

Relevant information was collected with the help of a pre-designed questionnaire, prepared in accordance with the objectives of the study. A total of 440 respondents including 280(63.63%) from urban and 160(36.37%) from rural area were selected. In hospital only those ladies were selected who belong to the main city area of Peshawar, but just to obtain the information on our door step, our hospital was labeled as an urban area for collecting information on immunization practices. From the rural setup information was collected by female medical students. Informed consent was taken from every women and she was assured that the information would not be disclosed. We faced problems in getting the relevant information from rural women because of Pushtoon culture and taboos that specially influence our society.

The questionnaire contained preliminary information regarding age, address and education of the respondents. It also contained information about the manner of immunization initiation, history of full immunization for polio, hepatitis B, diphtheria, pertussis, tuberculosis, measles and tetanus vaccination in infants of urban and rural women of Peshawar.

Finally statistical analysis of the data was performed and association of risk factors with breast-feeding was studied.

Results

1. History of vaccination: Of the total sampling 98.57% of the urban and 86.37% of the rural women had started vaccination of their infants. Of the urban sampling 67.14% and rural sampling 48.12% had fully immunized their children for polio, hepatitis B, diphtheria, pertussis, tuberculosis, measles and tetanus vaccination. Table No I.
2. Education of the parents and its impact on immunization of children. Mother education level in urban and rural areas varies significantly and this has its impact on the EPI services. Maternal education levels were: illiterate (urban 54.64%, rural 78.75%), primary (25%, 11.87%), matriculate (11.78%, 6.25%) while only 1(0.71%) of urban and none in rural women had postgraduate qualifications. Father education was: illiterate (urban 21.78%, rural 39.37%), primary (32.85%, 24.37%), matriculate (16.85%, 16.25%), while postgraduate qualification (7.14%, 1.25%) recorded. Table No II.
3. Occupation of mother and its impact of EPI program: Maternal occupation also influenced the EPI program in both set ups. Maternal profession recorded was: house wife (urban 55.71%, rural 70.62%), skilled woman (25.71%, 13.75%), student (11.78%, 10%) and government servant (6.78%, 1.8%). Table No III.

Table 1. Vaccination history (N=440).

Vaccination Started	Number of the urban subgroup (n=280)	Number of the rural subgroup (n=160)
YES	276(98.57%)	139(86.87%)
NO	4(1.42%)	21(13.12%)

Table 2. History of fully immunization for polio, hepatitis B, diphtheria, pertussis, tuberculosis, measles and tetanus vaccination. (n=440).

History of fully immunization for polio, hepatitis B, diphtheria, pertussis, tuberculosis, measles and tetanus vaccination.	Number of the urban subgroup (n=280)	Number of the urban subgroup (n=160)
Infants fully immunized for polio, hepatitis B, diphtheria, pertussis, tuberculosis, measles and tetanus vaccination.	188(67.14%)	77(48.12%)
Infants not yet fully immunized for polio, hepatitis B, diphtheria, pertussis, tuberculosis, measles and tetanus vaccination.	92(32.85%)	83(51.87%)

Table 3. Education of the parents (n=440).

Education levels	Number of the urban subgroup (n=280)		Number of the rural subgroup (n=160)	
	Mother education (n=280)	Father education (n=280)	Mother education (n=160)	Father education (n=160)
Illiterate	153(54.64%)	61(21.78%)	126(78.75%)	73(39.37%)
Primary education	70(25%)	92(32.85%)	19(11.87%)	39(24.37%)
Matriculate (SSc)	33(11.78%)	47(16.85%)	10(6.25%)	26(16.25%)
Secondary Intermediate education	16(5.71%)	27(9.64%)	4(2.5%)	8(11.25%)
Graduate	6(2.14%)	33(11.78%)	1(0.62%)	12(7.5%)
Postgraduate qualification	2(0.71%)	20(7.14%)	-----	2(1.25%)

Table 4. Occupation of mother and its impact of EPI program (n=440).

Occupation of mother	Number of the urban subgroup (n=280)	Number of the rural subgroup (n=160)
House wife	156(55.71%)	113(70.62%)
Skilled women	72(25.71%)	22(13.75%)
Government servant	19(6.78%)	3(1.8%)
Student	33(11.78%)	16(10%)

Discussion

In Bangladesh the various factors affecting immunization of children were recorded. Acceptance of DPT, measles and BCG vaccinations were the dependent variables. The independent variables included proximity to health facilities, frequency of visit by health worker, respondent's mobility, media exposure, education, age, economic status of household, region of residence, and gender of child [7]. Girls also have poorer access to health services than boys: in Bombay boys have immunization rates 16% higher than girls.[3] In the present study of urban sampling 67.14% and rural sampling 48.12% had fully immunized their children for polio, hepatitis B, diphtheria, pertussis, tuberculosis, measles and tetanus vaccination. In Pakistan during 1990-1999, reported coverage estimates of children aged 0-11 months with ≥3 doses of oral poliovirus vaccine (OPV3) ranged from 57%-83% (*3*); however, surveys in 1998 and 1999 reported <60% coverage. In 1999, coverage by province ranged from 27% in Balochistan to 62% in Punjab, and during January-March 2000, surveys conducted in 20 Pakistan districts indicated OPV3 coverage of 19%-82% (median: 43%) [9]. Mother education level in urban and rural areas varies significantly and this has its impact on the EPI services; maternal education levels were illiterate (urban 54.64%, rural 78.75%). Our findings meet those of a study from India that shows 73% of rural women of childbearing age are illiterate [10]. Educational attainments showed a strong association with every important variable considered, including age at marriage, fertility behavior, the use of and demand for family planning, number of children desired, use of antenatal care, delivery in a health facility, vaccination and nutritional status of children, use of oral dehydration solution, and infant and child mortality [11]. Maternal occupation also influences the EPI program in both set ups; maternal profession recorded was: house wife (urban 55.71%, rural 70.62%), skilled woman (25.71%, 13.75%), student (11.78%, 10%) and government servant (6.78%, 1.8%). Research demonstrates that low-income women are having difficulty combining work, breastfeeding and immunization of their infants, which has important health implications for their infants, and that women working in administrative and manual occupations may face special constraints [12].

Conclusion

Starting immunization of infants in urban and rural areas is satisfactory but full immunization of infants is not as satisfactory especially in the rural setup and they are often missed in the repeated doses of vaccination. Maternal education and occupation are the main factors that strongly affect the immunization on children and EPI program goals.

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Rising Caesarean Section Rate in Developed Countries is not the Best Option for Childbirth

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Key words: Pregnancy, Caesarean section rates, Vaginal delivery, Obstetricians, Health hazards, HIV transmission.

Abstract

Obstetric interventions, especially caesarean sections (CS) have increased in recent years in all developed countries. The steady rise in CS rate is an emerging issue of concern in mother-child health care and a matter of international attention. Unnecessary CS have resulted in increased infection, hemorrhage, organ damage, drug complications, prematurity, increased neonatal illness, and longer hospitalization. Nevertheless, CS rates tend to vary widely with clinical and socio-demographic factors of patients as well as the attitudes of health providers. Consequently, national CS rates do not reflect what is happening locally, supporting the trend toward monitoring rates at the level of individual hospital or physician. Thus, the main purpose of this study is to explain the complications and responsiveness about CS as well as to encourage women in their childbearing ages (15-49) years to make their decision for experiencing vaginal delivery.

Introduction

Human childbirth is one of the most important natural processes of human life. It has also however always been a very painful process and complications endangering the mother and baby are always a possibility. CS is a surgical process where birth is through an incision in the wall of the uterus, rather than through the vagina, which has a lot of controversy surrounding it in today's society. It is almost certainly one of the oldest operations in surgery, with its origin lost in antiquity and ancient methodology. Originally performed only in the interests of the mother, it is now used quite freely in the interest of the fetus too. The justification for CS includes both medical and non-medical reasons. It may be planned in advance (elective section) or be performed at short notice, particularly if there are complications or difficulty in labor (emergency section). An elective CS is performed one to two weeks before the baby's due date. This ensures the baby is mature before delivery. Now the number of elective CS has risen more slowly than the number of emergency CS. Approval rate of CS without medical indication varies considerably in different countries. According to a survey conducted by United States (US), 46.2% of gynecologists would choose CS for themselves or their partner after a low-risk pregnancy [15]; in contrast 98% of Norwegian obstetricians prefer vaginal delivery [5]. It thus became an obstetric dogma that all obstetricians should struggle to achieve vaginal delivery, and prevent unnecessary CS. Again, several factors such as decreasing maternal morbidity and mortality after CS, patient autonomy, possible damage to the pelvic floor due to vaginal delivery and forensic aspects might influence an obstetrician to perform CS without medical indication. CS rates over recent decades have widely been condemned as being too high. Certainly their doubling over the last 20 years followed, rather than mediated, sharp declines in maternal and peri-natal mortality. Their huge variation in the developed world (6-38%) cannot be explained on obstetric grounds, and numerous analyses have shown that there are chief determinants of two to three fold differences within countries.

The incidence of CS is seen to increase in primigravidas as compared to multigravidas. Obviously, the safest birth is spontaneous vaginal birth, but doctors need a system to support women to get through CS. The indications for CS are usually maternal, fetal or physical-related factors or a mixture of the three. In some situations a CS may be the only safe option for mother and baby, which all involve there being a complication during pregnancy or labor, for example when: i) the placenta lies so low in the uterus that it covers the exit to the birth canal, ii) the obstetrician finds out that the baby's health is threatened due to lack of oxygen, iii) the baby is in an abnormal position, iv) the baby is very large in size, v) the mother is carrying twins, triples or other multiples, vi) there is vaginal bleeding and a natural delivery is not about to happen, vii) the umbilical cord falls forwards and the baby cannot be delivered easily, viii) the mother will be unable to deliver the baby herself. In other situations a CS may be considered the safest option even

though a vaginal birth is a possibility: i) if the baby is lying with its head upwards, ii) if the mother is affected by high blood pressure or other illness, iii) if the unborn baby is too small or too weak to survive a natural birth, iv) if the mother has had a CS birth before. In very rare cases, the mother is so anxious about the delivery that a CS is considered. Several early studies showed that an elective CS significantly reduced mother-to-child transmission of HIV compared to vaginal birth.

These are fundamentals of the vast increase in the number of CS that are performed and the fact that most of the procedures are done without any medical reasons. These numbers are still on the rise and there is a major push to decrease the number of CS and to return to natural childbirth. This is a very topical issue in modern western societies and the question of why officials feel this move away from CS and towards natural childbirth needs to be made, and whether this is valid, is explained as a part of this investigative study.

Global experiences

The CS rates have risen through a combination of medical, cultural and organizational factors. There have been a number of reports of international and national differences in CS rates from both developed and developing countries and multi-factorial causes determine the increasing trend of CS rates. There is concern about the dramatic increase and ongoing overuse of CS. The rate for first-time mothers may approach one in three [9]. Every year since 1970 no less than 5.2% of American women have given birth via major abdominal surgery and today more than one in four or 27.6% of women have a CS for the birth of their baby, and New York State's rate of CS is 28.4% [35] and the figures are still rising. The average CS rate for NY City hospitals is 26.4%. The hospitals with the highest CS are performed yearly in Latin America revealing CS rates ranging from 16.8% up to 40% [6]. In the 1950s, 3% of births in England were by CS and by the early 1980s this had risen to 10% and in the 1990s rates started to climb rapidly, from 12% in 1990 to 21% in 2001, in 2000, the CS rates in Wales was 24%, Northern Ireland 23.9% and Scotland 21% [12]. In 2003, the CS rates are 22% in England, 24.3% in Scotland, 24.5% in Wales and 25.8% in Northern Ireland in 2002. In 1970, 20% of births in Brazil were CS and this has now risen to 40%. New Brunswick has one of the highest CS rates in Canada: 27% in 2001-2002, compared to a national average of 23% of in-hospitals [8]. According to the annual report of the Sotomayor Maternity hospital in Guayaquil, Ecuador, 58% of the total births were CS [18]. Korea shows the world's highest rate of CS. In 1999, the rate was 43.5% and it was 40.5% and 38.6% in 2001 and the first half of 2003, respectively. In this connection, the World Health Organization (WHO) recommended that there is no justification for any region to have a higher CS rates than 10-15% [37].

Hazards of CS to the mother

No evidence supports the idea that elective CS is as safe as vaginal birth for mother or baby and the complications for the mothers are common. Maternal mortality attributed to CS is very difficult to calculate, because the incidence of maternal death sometimes is due to underlying disease rather than the surgical procedure. In fact, the increase in CS births risks the health and well-being of childbearing women and their babies. Complications, particularly infections, are more common in woman having CS than woman having vaginal delivery. Reported rates of post-cesarean surgical site infection varies greatly from 0.3% in Turkey [38], 11.6% in Brazil [31], to 18.37 in Saudi Arabia [13]. The main risks are for the mother, such as heavy bleeding at the time of surgery and after delivery, infection in the wound or the development of a blood clot in the leg veins. Further, there are risks to CS, especially the small but important risk of abnormally positioned or adherent placentation with recurrent abdominal delivery [2]. Even this, however, needs to be offset against the avoidance of pelvic surgery in later life. Then there is the increased relative risk of respiratory distress with pre-labor CS at 38 weeks [24], although this is usually treatable with a good outcome, unlike unexplained intrauterine death at or after the same gestational age [10]. Women run 5 to 7 times the risk of death with CS compared with vaginal birth [33]. Complications during and after the surgery include surgical injury to the bladder, uterus and blood vessels (2%), hemorrhage (1 to 6% women require a blood transfusion), anesthesia accidents, blood clots in the legs (6 to 20 per 1000), pulmonary embolism (1 to 2 per 1000), paralyzed bowel (10 to 20% mild cases, 1% severe) [29], and infection (up to 50 times more common) [1]. 10% of women report difficulties with normal activities two months after the birth, and 25% report pain at the incision site as a major problem and one in fourteen still report incisional pain six months or more after delivery [11]. Twice as many women require rehospitalization as women having normal vaginal birth [20]. Especially with unplanned CS, women are more likely to experience negative emotions, including lower self-esteem, a sense of failure, loss of control, and disappointment. They may develop postpartum depression or post-traumatic stress syndrome [32]. Some mothers express dominant feelings of fear and anxiety about their CS as long as five years later, and women having CS are less likely to decide to become pregnant again. As is true of all abdominal surgery, internal scar tissue can cause pelvic pain, pain during sexual intercourse, and bowel problems. Reproductive consequences compared with vaginal birth include increased infertility [17], miscarriage [16], placenta previa, placental abruption [21], and premature birth [9]. Even in women planning repeat CS, uterine rupture occurs at a rate of 1 in 500 versus 1 in 10,000 in women with no uterine scar [30].

Hazards of repeat CS to the mother

Elective repeat CS is riskier for the mother and not any safer for the baby [25] and for previous CS, 7 out of 10 women or more who are allowed to labor without undue restrictions will give birth vaginally, thus ending their exposure to the dangers of CS. Patients with two CS were not given trial of labour at all and were subjected to CS when they were term. Elective CS carries twice the risk of maternal death compared with vaginal birth [14]. Old scar tissue increases the likelihood of surgical injury. One more woman in every 100 with a history of more than one CS will have an ectopic pregnancy [16]. Hemorrhage associated with ectopic pregnancy is one of the leading causes of maternal death in the US. Compared with women with no uterine scar, women have more than 4 times the risk of placenta previa with one prior CS, 7 times the risk with two to three prior CS, and 45 times the risk with four or more prior CS [2]. Placenta previa more than doubles the chance of the baby dying and increases

the rate of preterm birth more than 6-fold [9]. Compared with women with prior births and no previous CS, women with one prior CS or more have as much as 3 times the risk of placental abruption [16]. With placental abruption, 6 in every 100 babies will die, and 3 in 10 will be born too early [23]. The odds of placenta accreta jump from 1 in 1,000 with one prior CS to 1 in 100 with more than one prior CS [3]. Nearly all women with this complication will require a hysterectomy, nearly half will have a massive hemorrhage, and as many as 1 in 11 babies and 1 in 14 mothers will die [26]. The incidence of placenta accreta has increased 10 fold in the last 50 years and now occurs in 1 in 2,500 births [1]. Women having elective repeat CS are more likely to experience hemorrhage requiring transfusion, blood clots, and infection [30]. Postpartum recovery after repeat CS is even more difficult when there is another child or children to care for. So, it cannot necessarily be concluded that CS is more dangerous than vaginal birth because pre-existing conditions may have influences on the decision to carry out CS and the outcome.

Hazards of CS to the baby

Especially with planned CS, some babies will inadvertently be delivered prematurely. Babies born even slightly before they are ready may experience breathing and breastfeeding problems. At least 1-2% babies will be cut during the surgery [36]. Studies comparing elective CS or CS for reasons unrelated to the baby with vaginal birth find that babies are 50% more likely to have low Apgar scores, 5 times more likely to require assistance with breathing, and 5 times more likely to be admitted to intermediate or intensive care [4]. Babies born after elective CS are more than four times as likely to develop persistent pulmonary hypertension compared with babies born vaginally [22]. Persistent pulmonary hypertension is life threatening. Mothers are more likely to have difficulties forming an attachment with the infant [21]. This may be because women are less likely to hold and breastfeed their infants after birth and have rooming in and because of the difficulties of caring for an infant while recovering from major surgery. Babies are less likely to be breastfed. The adverse health consequences of formula feeding are numerous and can be severe.

Reduction of CS rates

Some health care experts believe that half of those are unnecessary in the way that they are performed for non-medical reasons like the patient or doctor's personal schedule or simply due to women's preferences, though not acceptable. A recent birth certificate-based study on deliveries in Louisiana demonstrated that the changes in the state's CS rate from 1993-2000 were not related to changes in potential risk factors as reported on birth certificates and concluded there was a high rate of unnecessary CS [19]. The CS rates have fluctuated somewhat over the years as health care professionals have come to varying conclusions about the relative advantages of CS and vaginal deliveries. There are several factors, which have contributed to the rise in CS rates, and these factors have been the subject of intense debate. While doctors state that decisions to perform CS are based on concerns of patient's safety some women feel that their choice is contained by doctors' interest in more lucrative and less time-consuming births. A fear of malpractice suits has also likely influenced the rates of surgical invention. In some cases, doctors are pressured by hospital officials to perform CS in order to avoid liability. Better socioeconomic conditions were associated with higher CS rates. Some pregnant women demanded a CS as were afraid of pain. It is very important that a woman makes her own informed decision in association with her healthcare team, concerning mode of delivery. Consequently, CS increases many of the risks to mothers and babies. Beijing has seen the rapid increase in CS in the past two decades and more, with the highest rate reaching 60% in some hospitals. The CS rates stood at an average 19.5% annually in Beijing during the 1980-1984 periods. The rate had kept rising in the following years and hitting 47.92% by the end of 2004. A recent national survey in the United Kingdom (UK) indicated that 92% of women wanted to be delivered by the route that was safest for the baby: the same survey showed that 54% of obstetricians thought that was by CS [34]. There are further reasons why the CS rate is destined to rise further. Firstly, women in the developed world are reproducing later in life, and rising age correlates linearly with CS rates [28]. Next, babies are getting bigger, as are their mothers [7]. Indeed, anthropologically man is the only mammal in which the fetal head almost entirely occupies the maternal pelvis, and has and is evolving away from a reliance on vaginal birth [32]. Finally, the litigation costs resulting from vaginal delivery continue to rise exponentially. One wonders how much longer society, and particular health care providers, will continue to be able to afford vaginal delivery. Patient choice is assuming greater importance in maternity care and in this light efforts to reduce the CS rate further seems doomed. Medical opinion is changing with a further rise in rates not only to be expected, but may also be desirable. The assumption that CS rates are too high is no longer tenable, and reducing rates may be counter to maternal and fetal interests. CS rates in the twenty first century will be driven up by consumer demand [27], and will almost certainly exceed 50%. As the CS rate has increased year on year so the gynecological complications of vaginal birth have been highlighted in the medical and lay press. This has led to many women believing that vaginal birth is an outdated, unnecessarily prolonged, painful and humiliating experience. Birth is a natural process and so when there are no complications there should be no need for it to be made into a medical procedure. Aforementioned are valid arguments supporting the decline in the number of CS performed which is an important issue today.

Recommendations

There is a general consensus amongst clinicians that a high CS rate is undesirable. One way to respond to this would be to set targets for a reduced CS rate. For this women must give unbiased information on the benefits and risks of vaginal birth versus CS. Hospitals should evaluate variations in CS rates among practitioners at their institution. The obstetric community should educate clinicians, hospital management, and patients that CS based on non-clinical factors is not associated with improved maternal or neonatal outcomes. Institutions should use comparative outside data on CS rates to evaluate their own CS rates. Hospitals or practitioner groups with high CS rates can consider establishing separate 24 hour, in house obstetric coverage by physicians who are solely responsible for the management of the intrapartum patient. To be effective, actions to reduce CS would need to involve public health

authorities, medical associations, medical schools, doctors, midwives, nurses, the media, and the general population. There is an alternative approach - careful differentiation during pregnancy of high risk and low risk groups of pregnant women with different management of labor. The low risk group may be attended during labor by primary care attendants without electronic monitoring but with strict criteria for referral. A close cooperation between midwives, general practitioners, and obstetricians, with mutual respect for each others' special abilities, is a prerequisite for such a system to work.

Conclusion

This study examines reasons for the increase in the CS rate and the complications for health policy, The most common way that women in the developed countries give birth was by CS. So, the overall CS rate has increased significantly by increasing the number of women who have a first, or primary CS. Many changes have occurred in obstetric practice in the past decades. The rising CS rate has been associated with a fall in operative vaginal deliveries, as well as a fall in spontaneous births. The change in the obstetric population to delay in child bearing and smaller families, will have contributed to the change but the huge countrywide differences in CS rate noted in the USA and the UK is disquieting and is suggestive that not all operative deliveries are necessary. So far, this study may help to encourage women to make their decision for experiencing vaginal delivery, as an overwhelming majority of the experts in the field would choose it for themselves or for their partners. Researchers must take this issue seriously so as to oppose the unnecessary medical risks and economic burdens involved with unwanted CS births.

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Chronic Headache: The role of the Nasal Septum Deformity

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Key words: Headache, Deviated nasal septum, Sub-mucous resection

Abstract

Objective: To investigate the nature of these headaches and the outcome following septal surgery.

Patients and Methods: Fifty-eight patients of either sex and above the age of sixteen years who presented to Otorhinolaryngology clinic suffering from symptomatic nasal obstruction due to deviated nasal septum, were involved in the study. Patients with significant rhinitis and sinusitis diagnosed by history, physical examination, sinus X-rays, and antral lavage, were excluded from the study. All patients had submucous resection (SMR) of the deviated nasal septum and were followed up in the clinic for 6-24 months postoperatively (mean 13 months).

Results: Twenty-five patients (43%) had headaches preoperatively occurring at least once a month for 1 to 10 years (mean 4.5 years). The site where the headache was most intense was most frequently found over the frontal region (58.9%). It was described mainly as pressure-like (47.4%) or dull (35.2%); occurring frequently in the mornings (37.6%). After surgery, eighteen of the 25 patients with headaches (72%) experienced relief of their headaches at a mean follow-up period of 13 months.

Conclusion: Nasal septum deformity is presented as an easily diagnosed and readily correctable cause of chronic headache within the confines of proper diagnostic evaluation and thorough elimination of other more serious causes of facial pain and headache.

Introduction

Chronic recurrent frontonasal headache is a very common complaint which may lead the patient to seek the services of physicians in a wide variety of medical and surgical disciplines. The etiology of these symptoms can run the gamut from rudimentary tension headache to frontal sinusitis and finally to a serious intracranial neoplasm. It is rewarding and refreshing to present a cause for such facial pain and headache, which is readily diagnosed and highly amenable to surgical intervention and is rarely accompanied with postoperative complications.

Headache is reported as a secondary symptom to nasal obstruction owing to septum deviation in rates that range from 23%1 to 58%2, and its surgical correction would lead not only to improvement of nasal obstruction, but also headache 3. Alternatively, it is also observed that failure of surgical treatment to control pain may be related to persistence, at least partial, of nasal obstruction 4.

Much interest has been focused on the improvement in nasal patency following septal surgery. To date, few studies have evaluated the incidence and nature of headaches associated with nasal obstruction due to septal deformity and the effects of septal surgery. Several mechanisms have been proposed to account for these associated headaches.

Experimentally-applied stimuli of touch, pressure, and faradic current to various parts of the nasal lining in humans resulted in referred pain which was mainly aching in nature and unless applied to superior nasal structures, maxillary in distribution5.

A deviated nasal septum coming in contact with the lateral nasal wall structures may be the stimulus, giving rise to referred headaches6,7. A second mechanism of headache production by a deviated nasal septum may be through blockage of the sinus ostia 8. This may be secondary to mechanical obstruction by the deviated septum or by local accumulation of mucosal tissue fluid, secondary to a narrowed nasal passage, based on the Bernoulli phenomenon9. The compromised sinus outlets then result in poor aeration of the sinuses leading to "vacuum" or "hypoxia" headaches8.

The aims of this study were to investigate the nature of these headaches and the outcome following septal surgery.

Material and Methods

The sample of this study was conducted in Otorhinolaryngology department at King Hussein Medical Center (Jordan).

Fifty-eight patients of either sex and above the age of sixteen years who presented to Otorhinolaryngology clinic suffering from symptomatic nasal obstruction due to deviated nasal septum were involved in the study.

All patients underwent a detailed history taking with special emphasis on history of headache and nasal obstruction and a thorough general examination; systemic examination and examination of the nose, throat and ears including nasopharyngoscopy as well as complete neurological examinations.

Patients with significant rhinitis and sinusitis diagnosed by history, physical examination, sinus X-rays, and antral lavage, were excluded from the study.

All patients had submucous resection (SMR) of the deviated nasal septum and were followed up in the clinic for 6-24 months postoperatively (mean 13 months).

Results

The number of patients involved in the study was 58 (8 females and 50 males) with a mean age of 32 years (range 16 to 43 years). Twenty-five patients (43%) had headaches preoperatively occurring at least once a month for 1 to 10 years (mean 4.5 years).

The site where the headache was most intense was most frequently found over the frontal region (58.9%). Other sites include maxillary, temporoparietal, nasal bridge and orbital regions.

Regarding the nature of headache, it was described mainly as pressure-like (47.4%) or dull (35.2%); occurring frequently in the mornings (37.6%). After surgery, patients were divided into two groups based on the relief of their headache at a mean follow-up period of 13 months. Group I consisted of patients with relief of headaches (18 cases, 72%). Group II consisted of those with no relief of headaches (7 cases, 28%).

Regarding the characteristics of headache, there was significant difference between the two groups for frontal headaches (11 and 3 cases in group I and II respectively) and for pressure-like headaches (10 and 2 cases in group I and II respectively), but not for headaches in the mornings.

There is significant difference between the two groups for postoperative relief of nasal obstruction (16 and 4 cases in group I and II respectively).

Discussion

Headache may be caused by a nasal passage abnormality; there is almost no limit to the many forms of deviation of the nasal septum, which can be found in the nasal passages. The majority of these deviations are traumatic in origin, but a small percentage is congenital 10.

Deviations of the nasal septum may be only minimal or they may be severe. Some will produce nasal obstructions and some will not. For example, a mere slight deviation may produce nasal airway obstruction if it is in the valve area. This, however, usually will not produce pressure on the lateral nasal wall and will, therefore, not result in headache. On the other hand, there can be marked septal deviation in another area, which does not result in airway obstruction. Nasal septum obstruction actually is a deviation resulting in contact with the lateral nasal wall 1.

A severe deviation of the nasal septum is often called septal impaction. This consists of a marked deviation of the septum (or a large septal spur) that exerts pressure upon the lateral nasal wall, which is not relieved by vasoconstriction. Some septal deviations will contact the lateral nasal wall, but on vasoconstriction, the turbinate tissue will become smaller and the contact with the lateral nasal wall will be alleviated 11.

Either of these conditions can be an etiological factor in headache. This is especially true in the case of septal impaction. Not all patients who have septal impactions, however, experience headache 12.

Regardless of the presence of nasal septal deformities, little is said about the functional aspect, that is, the correlation between nasal obstruction per se and headache. We know that many authors consider headache as an associated symptom of nasal obstruction, and it is the second most common cause presented by these patients 1,2,11. Regardless of the anatomical variation that causes obstruction, nasal poor ventilation and consequently complementary oral breathing lead to other pathophysiological mechanisms, such as absence of nasopulmonary reflex, with ventilation repercussion of pulmonary expansion, in addition to posture affections, reaching areas that go beyond the care provided by Otorhinolaryngologists.

In the present study, 43% of patients with blocked nose secondary to deviated nasal septum had associated recurring headaches, the frequency comparable to those from other studies 1,1,13,14.

The headaches in the present study were mainly pressure like and most intense over the frontal region, and similar to those observed by Schonsted-Madsen et al 11 in their study of patients with nasal obstruction and headaches.

Around the turn of the century, several reports in the otolaryngology literature described patients whose headache resolved with certain nasal operations to correct an anatomical abnormality (such as a deviated septum) 15,16. However, there is correlation between improvement of nasal obstruction and improvement of headache in patients submitted to nasal surgical treatment such as septoplasty 1,2,3. What is the importance of each mechanism of symptom relief? Otorhinolaryngologists tend to locate the reasons for surgical procedures in nasal structures rather than in systemic mechanisms.

In the present study relief of headaches after surgery occurred in 72% of patients, which is comparable with other studies 2, 3.

Conclusion

Nasal septum deformity is presented as an easily diagnosed and readily correctable cause of chronic headache within the confines of proper diagnostic evaluation and thorough elimination of other more serious causes of facial pain and headache.

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