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Editorial

Writing for academic journals: A general approach

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Keywords: Scientific writing; Journal paper; Original article; Review article; case report

1. Introduction

It is an important and difficult job to write and publish an academic paper. A large percentage of the manuscripts that are submitted to academic journals for publication are rejected because the author's research is not credible or the manuscripts are poorly written. This paper provides a general approach and some key points for writing and successfully publishing journal papers.

An essential approach in preparing a journal paper is to follow the instructions provided by the target journal. Authors must follow the format and the template of the target journal when preparing their papers for submission. In this paper, we focus on some standard procedures for writing the three most common types of academic papers, i.e., review articles, original articles, and case reports.

2. Approach to writing a Review Article

If you are a post-graduate student who has been asked to perform a comprehensive review of the literature, you should use this opportunity to demonstrate your abilities by publishing some mini-review articles. Many people believe, incorrectly, that only senior researchers are eligible to write review articles. It is much more likely that a Ph.D. student who does not have prior writing or publication experience could publish a review article than publish her or his original Ph.D. research in good journal. It is vitally important that a researcher in this early phase of her or his career gain writing skills and develop her or his own successful style by writing mini-review articles, essays, and educational articles in the first year of post-graduate study. The quality of such reviews might be insufficient to warrant publishing in top-ranked journals, but there are hundreds of good journals that will gladly review and publish such work. When writing a review article, the author should always keep the following key points in mind:

- Review articles usually must have an unstructured abstract that is presented in a short paragraph.
- Review articles usually consist of three sections: Introduction, Discussion, and Conclusions. Some journals may ask that a short methodology section be added in which the methods used for the systematic review are explained.
- The Introduction usually consists of two or three short paragraphs. The opening paragraph should cover the background, and the rest of the Introduction section should identify the gaps in current knowledge and indicate the significance of the review.
- The Discussion section is the heart of a systematic review. The best approach in writing this section is to divide it into separate parts, based on the main variables of interest. In a good Discussion section, it is critically important that the main factor, "Gaps in the Knowledge," be addressed thoroughly.
- The author must summarize "Current Knowledge" and "Gaps in the Knowledge" in a short paragraph. The "Conclusions" section of a good review article must present the author's conclusions based in her or his

review work, state the author's hypotheses that were developed as a result of the work, and provide suggestions for future research that could address the knowledge gaps.

3. Organizing an Original Article

An original article is the most common type of academic paper. Its structure varies depending on the nature of the research and the format requirements established by the target journal. However, such articles usually consist of the following sections: Introduction, Methodology, Results, Discussion, and Conclusions. Some journals merge the Discussion and Conclusions sections. The key aspects that must be addressed in writing a good original communication are:

- The abstract of the original article must convey the main points of the research and the implications of these points. The abstract can be either structured or unstructured, depending on the requirements of the target journal. A structured abstract usually is comprised of four sections: Introduction, Methods, Results, and Conclusions.
- The two key elements in stating the problem in the Introduction are the use of statistics and citing published work.
- A good approach in concluding the Introduction of an original article is to present the general objective of the research followed by a list of the specific objectives. Usually, the research questions are not presented, but some journals may ask the authors to present their research hypotheses rather than specific objectives.
- The Methodology section usually begins with the "Research Design" followed by the "Study Population and Setting," "Sample Size and Sampling method," data collection, and a list of the methods, instruments, and measurement tools that were used. If the author developed a new measurement tool (such as a new questionnaire), he or she must describe the methods that were used to test and validate the reliability of the tool.
- Only the main findings of the study should be presented in the Results section. Tables and figures should be used conservatively, but they should contain as much information as possible. The most common quantitative findings that should be presented are P-values, confidence intervals, effect sizes, odds ratios, and relative risks.
- In the Discussion section, the author should compare the findings of the research with those of other work. To do this, the author must cite other research publications to indicate the importance of the research findings and to confirm the importance of the research. It is essential to address the limitations of the study in the Discussion section.
- In the Conclusions section, the author should generalize the findings if possible and indicate how policy makers can use the findings beneficially in practical applications. While doing so, however, the use of extreme and grandiose words and unsubstantiated claims should be avoided. Addressing the previously-mentioned "Gaps in the Knowledge" logically opens our eyes to new gaps that may lead to the development of new hypotheses.

4. Writing a Case Report Article

Case reports are important in that they can show us the path that future research should take. Many researchers believe that only unique cases are publishable; however, classical or educational cases are also good enough to be published. The key points that an author should consider in writing case reports are as follows:

- Without question, it is important to present unique case reports.
- Classical or typical cases also should be published because of their educational importance. Such cases provide many valuable educational tips for students.
- Case reports can be structured into the following sections: Introduction, Case Presentation, Discussion, and Conclusions. The Introduction is usually a short paragraph that covers the background and importance of the topic. The Case Presentation should provide all pertinent information about the case that is valid and worthy of discussion. The Discussion section of a case report should tell the readers how unique or classical or important the case is and why. In the Conclusions section, the author should specify what was learned from the case and the basis for upon which those things were learned.
- An unusual case may warn readers about the weakness of a standard operating procedure, or it may highlight required changes in protocols, procedures, and policies. Such cases may define a bigger problem that must be solved by future studies.
- Some case reports are good enough to furnish us with new hypotheses and trigger new research.

5. Publication ethics! Cite this article

In the case of using the approach presented in this article, the author(s) are invited to give appropriate credit to this educational article by including this article in the reference section of the manuscript and making the appropriate citations in the text or acknowledgement section.

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Letter to the Editor

The retired`s viewpoints regarding leisure time: A focus on sport

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Keywords: Pediatric; Disaster; Emergency medicine

Dear Editor,

We investigated the ways the old and retired use their leisure time in Tehran, Iran. In a field-type descriptive study we developed and validate a questionnaire to study the variables like the time they spent on physical activities, their satisfaction in terms of doing sport and their favourite sports. 220 subjects were selected randomly to participate in the study. The reliability of the questionnaire was confirmed at Cronbach's alph of 86%. Our findings indicated that the participants' involvement in physical activities was highly insufficient. In spite of knowing its health advantages, 62% and 56% mentioned the Joints problems and Athma as the main cause of their inadequate physical activity respectively. This resulted in fear and worried of doing physical exercise. Consequently, they should be informed about the physical activity advantages so that they may get rid of negative obsessions like fearing, falling down and loneliness at the time of exercise. Further investigations regarding the factors influencing the retired to participate in physical activities and exercise can provide a solution for this problem.

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Letter to the Editor

Pediatric Disaster Preparedness: Are we ready?

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Keywords: Pediatric; Disaster; Emergency medicine

Dear Editor,

No country is immune from disaster, though; certain areas might be more prone to a specific type of disaster. There are four main types of disasters: 1) Natural, like floods and earthquakes, 2) Environmental, like industrial accidents, 3) Conflict emergencies like war and terrorism, and 4) Pandemic emergencies like the recent H1N1 scare. A disaster has a major negative impact on all essential services including healthcare and disaster preparedness is the only way of reducing it. Pediatricians find themselves playing a central role during such an event as the families expect them to be knowledgeable, and look to them as a resource person for guidance. Handling a child during disaster is quite different to an adult. Children along with the elderly and disabled belong to the high vulnerability group. They are not ready to cope with the suddenness of the disaster physically, emotionally and psychologically. They have a larger and more permeable skin area which is susceptible during war and bioterrorism events. They are more easily affected during infectious pandemics. The logistics involved in Pediatric Emergency medical services, emergency equipment and intensive care is variably available in different countries. Handling children with special needs requires a team of multiple specialists including physiotherapists and child psychologists. Many children undergo bereavement as result of disasters which can have a huge emotional effect (1).

Pediatricians have a multipronged role to play in disaster management. They should provide all the available information not only to the adults but also the children in a language easily understood, according to their age and level of cognition. They should be able to satisfy all parents' queries, guide them regarding the needs of disabled children, emergency medications, and nearest emergency centre (2). Pediatricians should prepare, and regularly update office training programs in emergency procedures, including first aid, cardiopulmonary resuscitation, evacuation, the use of fire extinguishers, and participation in community disaster drills. They should make plans for storage of temperature-sensitive vaccines, medications, and supplies during extended periods of absent or limited power supply and coordination with local hospital and community emergency-response plans (3, 4). Pediatricians can prepare preparedness plans for schools and child care centers and act as a local level health coordinator with the public health department in case of a disaster.

During the past two decades there has been increased importance given to Disaster management and Adult emergency medicine. More developed is the country, higher is the level of preparedness. Many policies have been formulated by the International organizations like Red Cross and by almost all the national governmental organizations. But pediatric disaster preparedness plans have been unintentionally neglected and only minimally addressed. Not many developing countries have a pediatric disaster management in place. It's high time for a standard global charter to be developed for such an incident. Both the primary care pediatrician and the tertiary care pediatric subspecialist should keep themselves abreast to the needs of such a plan.

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Original Article

Comparative study of lipid profile in non-smokers, chronic smokers, and chronic smokers with acute myocardial infarction in men

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Abstract:
Introduction: Smoking is a major risk factor in the genesis of coronary atherosclerosis and development of coronary heart disease. Smoking may alter normal plasma lipoprotein levels. The present study was undertaken to compare the lipid profile between non- smokers (Group A) and chronic smokers (Group B) and also between chronic smokers (Group B) and chronic smokers with acute myocardial infarction (AMI) (Group C).
Methods: Thirty six apparently healthy non- smokers, 36 apparently healthy chronic smokers and 36 chronic smokers with AMI were selected for the study. Fasting venous blood samples were collected; triglycerides (TG), total cholesterol (TC) and high density lipoprotein cholesterol (HDL-C) were measured. Low-density lipoprotein cholesterol (LDL-C) and very low-density lipoprotein cholesterol (VLDL-C) were calculated by Friedwald's formula.
Results: The lipid profile was compared between Group A and Group B and also between Group B and Group C. There was a significant rise in TG, TC, LDL-C, VLDL-C and significant decrease in HDL-C in Group B compared to Group A. There was a significant rise in TG, TC, LDL-C, VLDL-C and significant decrease in HDL-C in Group C compared to Group B.
Conclusion: Smoking increases the risk of atherosis and smoking modulates the ischemic heart disease risk through gene-environment interaction. Further studies are required to ascertain the gene environment interaction.

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Keywords: Non-smokers; Chronic smokers; Acute myocardial infarction; Lipid profile

1. Introduction

Smoking is a serious public health problem and the most important avoidable cause of death in the world. Smoking has been a strongly implicated risk factor and also leading cause of death for chronic obstructive pulmonary disease (COPD), lung cancer and atherosclerosis (1). It has been suggested that regularly smoking more than 10 per day, constitutes a major risk for coronary heart disease (CHD) (2).

Numerous reports have demonstrated the increased risk of coronary problems in smokers. Smoking is thought to have an influence on the prevalence of myocardial infarction by means of several mechanisms, including atherosclerotic injury, increased platelet aggregation, increase in the levels of adhesion molecules, and fibrinogen leading to vasoconstriction (1). Cigarette smoke is a complex mixture of chemicals containing more than 4000 different constituents. Some of the compounds identified include pyridine alkaloids such as nicotine, ammonia,

acrolein, phenols, acetaldehyde N-nitrosamine, polycyclic aromatic hydrocarbons such as benzopyrine, combustion gases such as carbon monoxide, nitrogen oxides, hydrogen cyanide, and trace metals, α-emitter radioactive elements such as polonium, radium and thorium (1). In smokers, nicotine causes a significant increase in the levels of serum cholesterol, triglycerides and LDL-C, but HDL-C is lower in smokers than non-smokers (2). Many studies have been compared the level of lipid profile among smokers and non-smokers, and non-smokers and smokers with myocardial infarction. None of the studies that we have reviewed have compared chronic smokers without myocardial infarction and chronic smokers with myocardial infarction. Therefore, the focus of this study was to find any other component that could play a role in lipid profile among chronic smokers and subsequent complications. In this context, the present study was undertaken to compare the extent of lipid profile in non-smokers (Group A), apparently healthy chronic smokers (Group B), and chronic smokers with acute myocardial infarction (AMI) (Group C).

2. Material and Methods

The present study was conducted at Hanagal Shri Kumareshwara (HSK) Hospital Bagalkot, Karnataka, India from May 2009 to June 2010. In the present study, 36 controls who were apparently healthy non-smokers were included after appropriate matching for age and sex. Thirty six apparently healthy chronic smokers and 36 chronic smokers with diagnosed AMI patients were selected after appropriate matching for age, sex and smoking habit. All of them were male subjects. Both chronic smokers and chronic smokers with AMI, who smoked 13 or more cigarettes per day for more than 12 years, were selected from HSK Hospital. Those excluded from the study were persons abusing alcohol, ex-smokers, patients with diabetes mellitus, hypertension, renal diseases, hepatic impairment, endocrine disorders, obese individuals and patients on drugs like β-blockers, lipid lowering drugs and thiazide diuretics. Ethical clearance was obtained from the S.Nijalingappa Medical College Ethical Committee. Informed consent was obtained from all subjects.

Each subject was interviewed and demographic details and smoking history was obtained. The demographic details included age, sex, body weight and body mass index (BMI). Smoking habits included smoking period and number of cigarettes smoked daily. Fasting venous blood samples were collected, and serum was separated and analyzed for the following parameters; Triglycerides (TG) was measured by GOP-PAP method (3, 4), optical density was measured at 546 nm. Total cholesterol (TC) and High Density Lipoprotein cholesterol (HDL-C) were measured by CHOD-PAP method (3, 4, 5, 6, and 7) optical density was measured at 500 nm. Low-Density Lipoprotein cholesterol (LDL- C) and Very Low Density Lipoprotein cholesterol (VLDL-C) were calculated by Friedwald's formula (8). Statistical analysis was done by 'z' test using SPSS version 15.0. The $p< 0.05$ was considered statistically significant. All the results were expressed as mean±SD.

3. Results

The demographic characteristics of all the subjects are shown in Table 1. All the subjects were male. There was no significant difference in mean age, body weight and BMI among Group A, Group B and Group C. The Group B and Group C were hypertensive, both groups smoked 13 or more cigarettes per day for 12 or more years. Table 2 Shows the lipid profile parameters in non-smokers (Group A) and chronic smokers (Group B). The mean TG in Group A is 120.25 ± 17.6 mg/dL and that of Group B is 168.12±15.5 mg/dL .The TC of Group A is 160. 05 ± 15.3 mg/dL and Group B is 192.37 ± 20.98 mg/dL. The mean HDL-C in Group A and Group B is 37.52± 4.22 mg/dL and 30.51± 3.75 mg/dL, respectively. Group A have a LDL-C mean of 98.48± 7.56 mg/dL and Group B 128.24± 14.3 mg/dL. The mean VLDL-C in Group A is 24.05± 3.52 mg/dL and Group B is 33.38± 2.86 mg/dL. The lipid parameters i.e. TG ($p<0.000$), TC ($p<0.001$), LDL-C ($p<0.001$) and VLDL-C ($p<0.000$), were significantly higher in Group B as compared to Group A. The HDL-C level ($p<0.001$) was significantly lower in Group B than in Group A.

Table 3 shows lipid profile in chronic smokers (Group B) and chronic smokers with AMI (Group C). The Group B have a mean TG of 168.12± 15.5 mg/dL and Group C, 198.16± 10.2 mg/dL. The mean TC in Group B and Group C was 192.37± 20.98 mg/dL and 221.13± 19.10 mg/dL respectively. The mean HDL-C in Group B was 30.51± 3.75 mg/dL and in Group C, 29.23 ± 3.05 mg/dL. The mean LDL-C in Group B was 128.24± 14.3 mg/dL and in Group C, 152.27± 14.01 mg/dL. The mean VLDL-C in Group B and Group C was 33.38±2.86 mg/dL and 39.63±2.04 mg/dL, respectively. The TG, TC, LDL-C and VLDL-C in Group C were significantly higher compared to Group B ($p<0.001$ for all parameters). But there was no significant difference in HDL-C in Group B and Group C ($p>0.05$).

Table 1. Demographic characters of non-smokers, chronic smokers and chronic smokers with acute myocardial infarction (AMI) *

Demographics	Non-smokers (Group A)	Chronic smokers (Group B)	Chronic smokers with AMI (Group C)
Mean age (Years)	42.3±9.7	43.1±10.3	45.6±10.4
BMI (Kg/m^2)	25.53±3.08	25.82±0.96	26.92±0.85
SBP (mmHg)	120.62±3.40	138.21±5.73	144.67±10.56
DBP (mmHg)	80.05±2.02	90.76±4.10	97.73±5.7
Smoking status	_	100%	100%
No. of cigarettes smoked daily		13±2	14±2 or more
Smoking period (Years)	_	12.2±2.1	12.90±2.50

BMI: Body mass index; **SBP:** Systolic blood pressure; **DBP:** Diastolic blood pressure.
* Values are presented as mean±SD.

Table 2. Lipid profile of non-smokers and chronic smokers *

Parameter mg/dL	Non-smokers (Group A)	Chronic smokers (Group B)	'z' Value	p Value
TG	120.25± 17.6	168.12±15.5	12.27	p<0.000
TC	160.05 ± 15.3	192.37±20.98	7.46	p<0.001
HDL-C	37.52±4.22	30.51 ±3.75	7.53	p<0.001
LDL-C	98.48±7.56	128.24±14.3	11.06	p<0.000
VLDL-C	24.05±3.52	33.38 ±2.86	12.6	p<0.000

TC: Total cholesterol; **TG:** Triglycerides; **HDL-C:** High density lipoprotein cholesterol;
LDL-C: Low density lipoprotein cholesterol; **VLDL-C:** Very low density lipoprotein cholesterol.
* Values are presented as mean±SD.

Table 3. Lipid profile of chronic smokers and chronic smokers with acute myocardial infarction (AMI) *

Parameter mg/dL	Chronic smokers (Group B)	Chronic smokers with AMI (Group C)	'z' Value	p Value
TG	168.12±15.5	198.16± 10.2	9.88	p<0.001
TC	192.37±20.98	221.13± 19.10	6.09	p<0.001
HDL-C	30.51 ±3.75	29.23±3.05	-	p>0.05
LDL-C	128.24±14.3	152.27±14.01	7.28	p<0.001
VLDL-C	33.38 ±2.86	39.63±2.04	10.69	p<0.001

TC: Total cholesterol; **TG:** Triglycerides; **HDL-C:** High density lipoprotein cholesterol;
LDL-C: Low density lipoprotein cholesterol; **VLDL-C:** Very low density lipoprotein cholesterol.
* Values are presented as mean±SD.

4. Discussions

In the present study there is a significant elevation of TG (p<0.000), TC (p<0.001), LDL-C (p<0.000) and VLDL-C (p<0.000) in smokers compared to non smokers, and there is a significant decrease in HDL-C (P<0.001) in chronic smokers than non-smokers. Cigarette smoking is the most important risk factor for myocardial infarction. Smoking can trigger myocardial infarction in individuals with minimal atherosclerosis or even with normal coronary arteries, promoting temporary coronary vessel occlusion, as a result of thrombus formation, coronary artery spasm

or both (9). Hyperlipidemia is a well-known risk factor for development of atherosclerosis; evidence suggests that oxidatively modified LDL contributes to the pathogenesis of atherosclerosis. Nicotine increases the circulatory pool of atherogenic LDL via accelerated transfer of lipids from HDL and impaired clearance of LDL from plasma compartment. Therefore, it increases the deposition of LDL-C in the arterial wall (2). Increased oxidative stress and conversion of LDL to oxidized LDL could lead to atherosclerotic lesions. Circulating products of lipid peroxidation and autoantibody titers to oxidized LDL are significantly increased in smokers. It has been reported that exposure to cigarette smoke extract (CSE) causes modification of LDL and actively taken up by the macrophages to form foam cells in culture. CSE exposure may also decrease the plasma activity of paraoxnase, an enzyme that protects against LDL-oxidation (9). Various other mechanisms leading to lipid alteration by smoking are:

1. Nicotine stimulates sympathetic adrenal system leading to increased lipolysis and increased concentration of plasma free fatty acids (FFA), which further result in increased secretion of hepatic FFA and hepatic triglycerides along with VLDL-C in the blood stream.
2. Fall of estrogen levels occurs due to smoking, which further leads to decreased HDL – cholesterol.
3. Presence of hyperlipidemia in smokers leads to increased TG, TC, LDL-C and VLDL-C due to decreased activity of lipoprotein lipase.
4. Consumption of a diet rich in fat and cholesterol as well as a diet low in fiber and cereal content by smokers as compared to non-smokers (10)

The present study is consistent with the previous studies. In this study, we have also compared chronic smokers and chronic smokers with AMI. The lipid parameters TG ($p<0.001$), TC ($p<0.001$), LDL-C ($p<0.001$) and VLDL-C ($p<0.001$) were significantly higher in chronic smokers with AMI than chronic smokers, even when both the groups were matched for age, body weight, BMI and smoking habits. Although cigarette smoking is a well established risk factor for vascular diseases, the genetic mechanisms that link cigarette smoking to an increased incidence of stroke are not well understood. C alleles were associated with higher risk of carotid plaque formation and were found to act synergistically with other inflammatory single nucleotide polymorphisms (SNPs) to increase carotid intima media thickness (IMT) specifically among the smokers. Cigarette smoke has been shown to increase the expression of proinflammatory cytokines including IL-6. Furthermore, several studies have demonstrated that IL-6 polymorphism may mediate carotid artery intima-media wall thickness. Genetic variation in IL-6 may modify stroke risk, and this increased risk may be due to synergistic effect between pro-inflammatory genotypes and smoking. The inflammatory gene SNPs are associated with early onset ischemic stroke among African-American women (1L-6) and cigarette smoking may modulate stroke risk through a gene-environment interaction (IL6, CD14) (11). The limitations of present study were:

1. Small sample size
2. Diet history was not taken in detail
3. Extent of smoking i.e. amount of smoke exposed to the lungs was not documented, which is very difficult to measure
4. All the participants were male

5. Conclusion

In conclusion, the present study suggests that cigarette smoking is one of the most important exogenous factors that causes significant rise in TG, TC, LDL-C, VLDL-C and significant decrease in HDL-C, thereby increasing the risk of atherosclerosis; and smoking may modulate the ischemic heart disease risk through a gene-environment interaction.

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Original Article

Impact of a Computerized Hospital Information System on the Staff workload in an Iranian Hospital Medical Records Department

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Abstract:
Introduction: A hospital information system (HIS) is a comprehensive, integrated information system designed to manage the administrative, financial and clinical aspects of a hospital. As an area of medical informatics, the introduction of a HIS into a hospital was purported to reduce the time spent on administrative and clinical activities by electronic data processing. However, adoption has been slow, and a key concern has been that staffs will require more time to complete their work using HIS. And also Most of available HIS have lots of deficiencies in data gathering, so hospital managers decided to keep their paper records and same time use HIS. Most previous studies addressing this issue have been done with concentration on clinical staff activities.
Methods: Comparative observational of the impact of a HIS on Medical Records Department time in four units: Admission Discharge and Transfer/ADT, Medical Filing and Retrieval, Medical coding/billing, and Medical Statistics. Measurements: We used a time-motion method to measure staff time spent in predefined activities. Medical Records staff monitored while using HIS and paper based system. 15 clerical medical records staff were observed treating 300 documents while still using paper-based records, and same persons were observed treating 400 patients' records with HIS.
Results: Following HIS implementation, the use of the computerized system decreased the average total workload by 61.35% (from 66.41 to 23.93 m).
Conclusion: Hospital Information System (HIS) reduces three nonclinical activities time noticeably which is vital to decision making and plays a crucial role in the success of the organization.

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Keywords: Medical records department; Hospital Information System (HIS); Medical Record

1. Introduction

The use of computers in Iranian hospitals has increased rapidly over the last decade, while nearly all hospitals in Iran keep and update their paper records besides keeping information in HIS(1). This fact has been accepted that paper based records will not have efficiency in modern facilities (2). The computerized Hospital information systems used in Hospitals aimed to meet the administrative purposes. Medical record department plays the most important role in developing and keeping administrative information in hospitals besides patients and medical information (3). Although many hospitals currently have established HIS, the scope of their applications is often limited to outpatient and inpatient billing, or in some hospitals, the mere replacement of the abacus or calculator (4). Medical Records activities may be categorized into four types. The first is admission-discharge and

transmission system (ADT) that is replaced traditional paper booking and scheduling system and master patient index. The second is an electronic Filing and Retrieval which replaces traditional filling system and Filing and Retrieval. The third is a computerized coding system which helps medical coders with providing list alphabetical list of diagnoses and codes (ICD-10, ICD-9 CM). And the fourth is electronic medical statistics system (5). All the four categories have been integrated into the HIS. However, the Medical Records subsystem function in the HIS has the following limitations: (i) not having the all functions of paper records; (ii) in Coding subsystem only the English language can be used for diagnoses while almost all the diagnoses were written in national language; and (iii) the system does not meet the specific needs of each department, such as statistical support due to late entry of information by nurses in the departments. Although HIS was implemented in our hospital, hospital managers decided to keep their paper records along to the HIS, this cause duplication in the tasks of Medical Records staffs (1, 6).

During the past 10 years, the validity of computerized information systems for several departments has been widely reported: the impact of electronic medical record systems on primary care, pediatrics, intensive care units and radiation oncology have been analyzed (7-10), and the effects of a HIS on Medical Records department staff was undeniable (11). However, the reported studies have focused on the qualitative change in staff work, rather than the quantitative measurement of efficacy of electronic systems. A comprehensive analysis of the efficiency of a hospital information system in Medical Records department, and the resultant change to the department staff workload, has not yet been performed. Therefore, we analyzed and quantified the change in the Medical Records department staff workload for their major task after the introduction of the HIS. This study will measure the time staff spent for completing predefined tasks in each two systems. Our results will be relevant to clarify the change of staff workload after introducing a HIS into Medical records departments.

2. Material and Methods

The study was conducted in 2010 at a 300 bedded trauma center hospital, which Computerized and Paper based system were undergoing simultaneously. The Medical Records Department of the hospital was studied for assessing the impact of Hospital Information System in comparison to paper based system on staff workload. The target population consisted of the records in the four medical records department units, which: 100 trauma case resulted to surgery were studied in each unit within different systems: (Admission and Discharge, Medical coding and billing, Medical Filing and Retrieval and Statistics units). The data were collected from a sample of 700, consisting of 100 HIS ADT, 107 Medical Coding HIS, 94 Medical coding paper based, also 100 Electronic Filing and Retrieval, and 93 traditional Filing and Retrieval, and 100 Electronic medical statistics to 103 manual statistics selected by the disproportionate stratified sampling technique. The inclusion criteria for selecting the sample were the cases who involved in trauma and surgery.

The tool used to collect the data was four standard time study forms. The forms were reconstructed with emphasis on the workflow. A pilot study was conducted for the HIS, to check the validity and feasibility of the study. The tool was administered to subjects, for ascertaining the reliability. The reliability calculated by using split method r = 0.73, 0.86 and 0.76, for coding, Medical Filing and Retrieval and the medical statistics respectively, which was high and satisfactory.

The effect of the electronic chart system on the staff workload was evaluated for four different clerical groups of staff: ADT staff, Medical coding and billing staff, Medical Filing and Retrieval staff, and Medical statistics staff. The average processing time per document was measured for two different methods, Computerized Information system and paper based system, and the results were compared through T test. For that purpose, two record groups, each composed of 400 surgical traumas, were selected.

Staffs evaluated all the necessary procedures in completing tasks in both Computerized Hospital Information System and paper based system. Any items that can be processed by only one method, such registering new inpatients in the CHIS, were excluded in the evaluation.

A sheet of paper was given to the staffs, which contained the list of all procedures for each task, which were required to record the time. The list of procedures given to each group of staff is summarized in Table 1. In cases where all procedures are performed consecutively, the times of starting and finishing whole procedures were recorded and the total elapsed time was calculated. When all procedures were not consecutive, the time taken for each step of the procedures was measured and the total elapsed time was computed. The workload evaluation by the ADT staff group focused on tasks required for admitting new patient, such as recording and entering patient's information, and scheduling appointments. Medical Coding staffs recorded the time required for coding the diagnoses, procedures and external causes. Medical Filing and Retrieval staff group measured the time taken to respond to the document request from inside or outside the hospital. And the medical statistics staff recorded the required time to calculate daily statistics regarding to the patients.

The staffs recorded the time taken to complete each patient record task, i.e. the time from the moment of opening the patient's paper record or electronic chart to the moment of completing predefined task. Finally, the total workloads measured in the two groups were compared. Paired t-test was performed to evaluate the statistically significant differences.

Table 1. Summary of procedures whose elapsed time were recorded

Staff group	Procedures
ADT	New patient registration
	Making new chart (paper or electronic)
	Entering patient information
	Selecting primary physician
	Recording all information necessary before hospitalization
	Scheduling an appointment
	Finding/opening the patients chart
Medical Filing and Retrieval	receiving the file requests
	detecting file number
	retrive the files
	confirming file and send to the request site
	Recording (or entering) ID on the chart
Medical Coding	detecting diagnoses, procedures and external causes
	look-up the codes
	registering the codes
Medical statistics and information	gathering data from inpatient and outpatient units
	calculating the indexes

3. Results

The average workload for four groups of staff is summarized in Table 2. As shown in the table, the use of the computerized system decreased the average total workload by 61.35% (from 66.41 to 23.93 m). The HIS decreased the workload for two groups of staff noticeably. The largest decrease of average workload was observed in the Medical Statistics staff group, which was a 90.2% decrease (from 25.85to 2.55 m). The average workloads of medical Filing and Retrieval, and ADT staff decreased by 59.7% (from 30.87 to 12.45 m) and 11.8% (from 4.5 to 3.97 m) respectively. However, the average workload of the medical coding/billing staff group also decreased by 4.5% (from 5.19 to 4.96 m). This negligible decrease was due to the extra time necessary to enter the required parameters such as insurance/phone number parameters into HIS.

The introduction of the computerized system into medical records departments has increased the accuracy of required data for hospital administration by reducing random errors. According to the independent sample t-test in ADT unit, comparison of two systems shows statistically significant differences. Which means HIS system reduce time and workload of the ADT staff ($p<0.001$). In the second unit, filing and retrieval, there is more significant and noticeable change. Qualified records which were studied in filing and retrieval in HIS were 107 and paper based system 94 documents. Average of time needed to complete filing tasks in paper based system was 2.4 times greater than HIS. Comparison of the means by sample t test has shown that there is a statistically significant difference between HIS and paper based system averages ($p<0.001$).

In medical coding and billing unit the coding process in traditional system takes 0.23 minutes more times than HIS. T test for average shows that there is NO significant statistically differences between the systems. ($p=0.36$) In the fourth and final unit, Medical statistics unit, with application of HIS, staffs experienced 10 times less needed time to do statistics procedures rather than traditional system. Testing the averages of two systems show that there are statistically significant differences ($p=0.36$).

Table 2. Comparison of the average workload of Medical records department staff

Staff group	Average workloads (range) (m)		Average workload reduction (%)	P-value
	Paper based	HIS		
ADT	4.5	3.97	11.80%	<0.01
Filing and Retrieval	30.87	12.45	59.70%	<0.01
Medical Coding	5.19	4.96	4.50%	0.36
Statistics	25.85	2.55	90.20%	<0.01
Total	66.41	23.93	61.35	<0.01

4. Discussions

The introduction of Hospital Information Systems has many advantages, as mentioned above, In summary, we quantitatively analyzed the efficacy of the HIS system for four different groups of staff and proved that this system decreased the total workload of These four groups of staff by almost 61%, and thereby improved the efficiency of hospital management. In Coding section, the system lagged from code indexes. The HIS coding does not consist of coding manuals, natural language or computerized coding assistant, and also not the alphabetical index, there are lots of vague field for coding in this system. Also the nurses' notes or physician orders are not entered to this system, this causes medical coders and medical statistics clerks enter data in medical record department in to the patient's records. One of the biggest challenges of HIS systems in Iran is still workflow. The workflow of the HIS systems are derived from traditional paper system, which is not suitable for computerized system.

The introduction of the Computerizes Hospital Information System (C.HIS) into medical records departments has decreased the time of patient admission by reducing work process. Hodge et al. reported the admission time for each patient was decreased to 5 minutes by using a Computerized Hospital Information System over 1 year (12). Moradi et al. studied the time spent for admission in HIS and paper based medical record system illustrated that some stages of admission process was increased. But total time of patient admission had 12% reduction in comparison with paper based system. The total time was 12 minutes which 5 minutes was taken for data entry (13). According to their data, it can be concluded that Shohada HIS had more accordance with work process and better performance.

For medical filing and retrieval unit, findings show that about 50% of total medical records time was consumed by staffs in this unit. In paper based system from the total time of 61.91 minutes, 30.78 minutes were spent in paper based medical filing and retrieval unit. By using HIS this time will decrease to 12,45 minutes which is equal to 59,7% time saving. Braden et al. in a report entitled Health information management department: reengineering file management at Texas University mentioned 99,3 % increase in accessibility and in 80% of cases decreased to 15 minutes(14).Mona Osman from Lebanese Institute of medicine depict the biggest problem of paper based filing and retrieval system that 27% of staff time would only be used to retrieval of the records(15).Young et al. in a survey of advantages and disadvantages of CPR wrote: medical retrieval time in HIS system is nearly zero (16). Zareie at Electronic archive of medical records versus paper based archive wrote: manual and traditional system of archiving records in Iranian hospitals resulted in facing lots of problems in filing and retrieval records. In his survey the time of retrieval and filing reduces to 5 minutes from 30. The highest rate of reduction was related to retrieval (17).

In medical coding unit, the results show that only 10% of total time was used by this unit staffs. Hannah Dennymarie in a study of average time for medical coding wrote, coding in a general hospital take less than one minute, and in a specialized hospital around 3 minutes for each record in electronic based system. Didear et al. in CPR successful stories reports that computerized assisted coding systems reduces more than 50% of staff time (18).

In summary, we quantitatively analyzed the efficacy of the Computerized Hospital Information system for four different groups of non clinical activities and proved that this system decreased the total workload of three groups of staff by _61%, and thereby improved the efficiency of patient management.

5. Conclusion

In summary, Hospital Information System (HIS) reduces three nonclinical activities time noticeably which is vital to decision making and plays a crucial role in the success of the organization.

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Case Report

Malignant clear cell hidradenoma of the upper eyelid

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Abstract:
Malignant clear cell hidradenoma is a rare eccrine sweat gland neoplasm, probably not reported in the eyelids, although benign clear cell hidradenoma of the eyelid has been reported. A 65 year old lady presented to Ophthalmology outpatient department at Sri R L Jalappa hospital and research centre with a solitary mass over the right upper eyelid associated with mechanical ptosis. Clinical diagnosis was a puzzle because of the shiny pinkish epidermal surface. The tumour was excised. Histopathological examination revealed malignant clear cell hidradenoma. Review of literature revealed it to be an extremely rare neoplasm.

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Keywords: Malignant; Clear cell hidradenoma; Eyelid tumor; Neoplasm

1. Introduction

Malignant clear cell hidradenoma is a rare eccrine sweat gland neoplasm probably not reported in the eyelids although the benign counterpart has been reported.

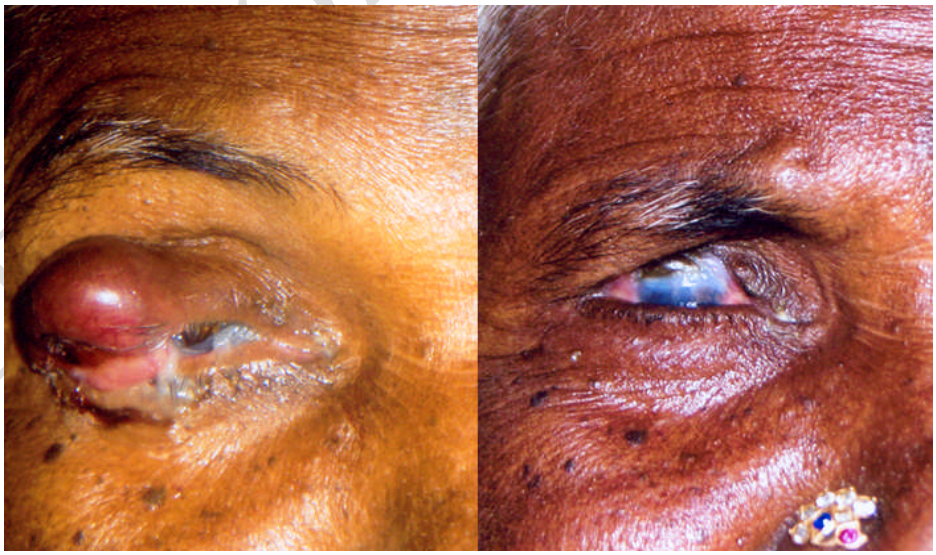

Figure 1. Showing the Pre operative Photograph showing growth on the right upper eyelid and the Post operative photograph

A characteristic finding is the presence of intracytoplasmic ductal differentiation, sometimes showing a well formed cuticular border; occasionally well formed ducts are also evident. In cases of doubt the use of the diastase- PAS reaction and immunohistochemistry are of value in highlighting these structures.

2. Case presentation

A 65 year old lady presented with a solitary mass on the right upper eyelid of 3 months duration to the outpatient department of ophthalmology at Sri R.L. Jalappa hospital and research centre. It was insidious in onset and gradually progressive in size associated with watering of eyes. Examination revealed a solitary 2.5cmx1.5cm hard nontender mass with a pink shiny epidermal surface. Mechanical ptosis, ectropion of lateral half of the eyelid and conjunctival congestion were noted. Right sided preauricular lymph node was palpable. Clinical diagnosis was a puzzle because of pink shiny epidermal surface. However a diagnosis of Meibomian carcinoma was made. 5mm curvilinear excision of the tumour margin along with excision of the right preauricular lymph node under general anaesthesia was performed. The resected specimen measured 4cmx2.5cmx2cm was sent for histopathological examination. On follow up the patient has been free of recurrence for 15 months since surgery.

Pathologic findings: A Solitary mass measuring 4cmx2.5cmx2cm on histopathological examination revealed the tumour was poorly circumscribed, cellular and composed of lobulated masses in the dermis infiltrating the subcutaneous tissue. The tumour lobules had round to oval cells with a vesicular nucleus displaying mild atypia, multiple nucleoli and numerous mitotic figures. Tubular lamina of varying sizes and cystic spaces filled with eosinophilic secretion were present within the lobules. Stroma showed mild to moderate infiltrate of lymphocytes and eosinophils. The preauricular lymph node showed only reactive hyperplasia and no tumour deposits.

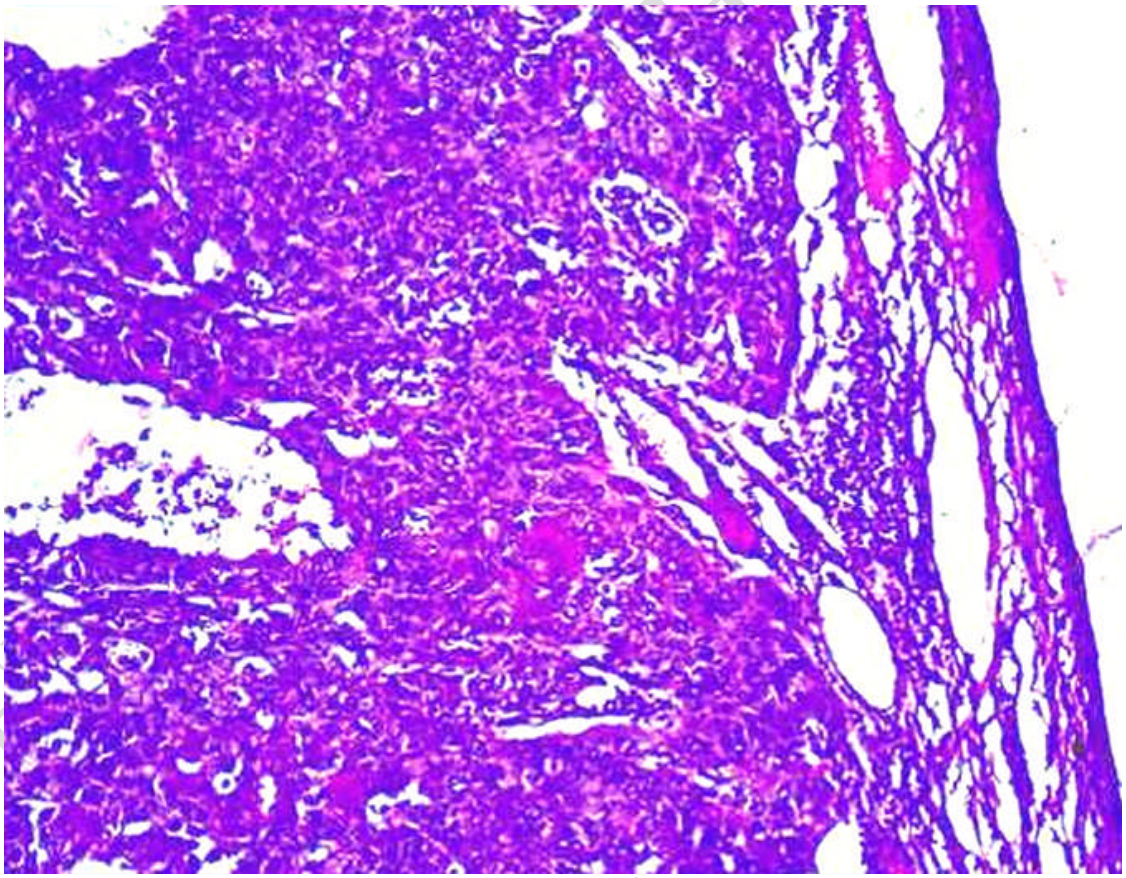

Figure 2. Photograph (450X) – Polygonal tumor cells some of which are showing clear cell changes, vesicular nuclei, prominent nucleoli and high mitosis (H&E)

3. Discussions

Sweat gland tumours are mostly benign. Malignancy is distinctly a rare feature (1). These tumours are postulated to arise from the intradermal duct of eccrine sweat glands1. The more recent literature however has described these tumours at a very diverse range of sites including the scalp, lip, neck, chest wall, breast, back, leg, toe and vulva except eyelid. The age range is wide extending from childhood to elderly. Sex predominance being females (2).The pathogenesis of this is not known except that malignant transformation of the pre-existent clear cell hidradenoma is very rare. In the reported case, the tumour has a potentiality of arising de novo and showing an aggressive behaviour as suggested by a short history. Secondaries in the lymph nodes, lungs and bones have been documented (2).

Various nomenclatures have been given, clear cell hidradenocarcinoma / solid cystic hidradenocarcinoma/ /Malignant clear cell myoepitheloma/ Malignant acrospiroma /clear cell eccrine carcinoma. This nomenclature is based on Microscopic and histochemical studies (2, 3). A case of benign clear cell hidradenoma of the eyelid in an elderly female was reported by Agarwala N S where structural and enzyme histochemical studies have shown to be intermediate between eccrine poroma and eccrine spiroadenoma (1). Grossniklaus reported a case of eccrine acrospiroma (clear cell hidradenoma) of the eyelid in which light microscopic and ultrascopic examination showed 2 types of cells to comprise the tumour: eosinophilic cells with intracytoplasmic tonofilaments and clear cells with intracytoplasmic glycogen granules (4). Tsuda Y has reported a case of benign clear cell nodular hidradenoma of the eyelid (5). Klaus Sellheyer has reported a case of clear cell hidradenoma on the abdominal skin (6). I.E liapakis reports 2 cases of malignant hidradenoma, one in the right axilla and other on the abdominal wall (7).

4. Conclusion

Malignant clear cell hidradenoma of the right upper eyelid is an extremely rare tumour. We believe this is a first case report of the kind. The awareness of this aggressive tumour should be kept in mind and must be added to the list of differential diagnosis of malignant eyelid tumours.

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View point

Neurodevelopmental Disorders among Indian Children: Needs Attention

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Abstract: Neurodevelopmental disabilities (NDDs) have always been an important concern but yet to be considered as a significant public health problem for children of low and middle income countries including India. It has been suggested that 85% of children with NDDs live in low and middle income countries but there are little data to support this because of lack of a comprehensive, valid, reliable and culturally sensitive screening as well as diagnostic tools and gloomy picture of research in this field due to myriad reasons. Till date there is no single best treatment package available for all children with neurodevelopmental disorders. So the preventive measures have prime importance in reducing the burden of neurodevelopmental disorders.

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Keywords: Neurodevelopmental Disorders; Epilepsy; Mental Retardation; Cerebral Palsy; Autism

1. Introduction

Neurodevelopmental disorders (NDDs) are a varied group of chronic conditions that begin during neurological development and usually lasting throughout a person's life time. The common disorders are Cerebral Palsy, Epilepsy, Vision Impairment, Hearing Impairment, Learning Disorders, Intellectual Disability, Attention-Deficit/Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), and Speech and Language Disorders. Child may have more than one disorder at a time.

2. Burden of Neurodevelopmental Disorders and Associated Factors

Neurodevelopmental disorders have always been an important concern and are much common than once thought. These disorders pose as one of the greatest threats to global public health (1). It is estimated that 10-20% of children have one or more mental or behavioral problems. The real dimension of the problem is largely hard to assess because of definition of the disorders, sampling procedures, instrument variations, variation across cultures, social classes and environment, training of data collectors and awareness about disorders (2, 3). It has been suggested that 85% of children with neurodevelopmental disorders live in low and middle income countries but there are little data to support this. India specific information base on neurodevelopmental disorders is also weak and published data is hard to come by because attention and resources are focused to more widely prevalent and visible vaccine preventable childhood diseases, nutritional deficiencies, and neonatal issues, etc. In addition to this, scarcity of information about these disorders has failed to recognize the grave situation, hindered policy making and investment. Hence there is an imperative need of community based epidemiological studies for planning accessible and appropriate need base services as these disorders are major health problems especially for children and disabling thousands of them every year. Coupled with this, formative research is the need of hour to know the community perception regarding neurodevelopmental disorders.

3. Diagnosis of Neurodevelopmental Disorders

Although medical science is a fast changing field and in fact, the whole concept of diagnosing and treating a patient is modifying rapidly however, the diagnosis of neurodevelopmental disorders is not determined by routine diagnostic modalities like blood tests, x-rays, CT scan or MRI scan and also it is more difficult to diagnose these conditions as compared to Diabetes, Hypertension, Cancer and Tuberculosis. The reasons may be having wide spectrum of presentation of symptoms/behaviours of the neurodevelopmental disorders, discrepancy in settings and purpose of assessment of child. Furthermore, with the progression of time and parallel neurodevelopmental maturation, the core features of a disorder may present differently and also it would be difficult at present for evaluators/clinicians to assess all children with neurodevelopmental disorders. Hence, the actual diagnostic instrument is a series of questions and/or observations. Therefore, the instrument should be accurate and robust enough to capture all the symptoms/behaviours. The extent to these instruments alter the probability of neurodevelopmental disorders depends on the validity of the test, or how much more commonly the test results are positive in subject's with neurodevelopmental disorders to those without neurodevelopmental disorders/healthy subjects and particularly subjects with conditions that are commonly confused with one of the neurodevelopmental disorders. For these reasons, it is necessary to adopt a screening approach first followed by specific diagnostic workup and appropriate and need base early interventions (if possible). It is generally accepted that the earlier the diagnosis is made, the better for the child, family and those involved around him/her. The merits of early diagnosis are: i) delivery of medical care to the child, ii) decrease the family stress, iii) enables provision for family support and iv) enables provision for genetic counselling for parents who may be considering to have other children. Coupled with this identifying these neurodevelopmental disorders in children as early as possible and providing effective interventions are public health imperative.

Although number of instruments for neurodevelopmental disorders have been developed and widely used in affluent societies, the information remains limited regarding the ability of these measures to diagnose neurodevelopmental disorders in resource constraint settings. The reasons may be that; these are not suitable and available in all countries and languages. For example, the instruments for ASD designed to identify autism have certain limitations that render them unsuitable for large-scale surveys, little evidence on validity, applicability to a limited age range of children in resource constraint settings with socio-cultural diversity and acceptability. Coupled with this, for some instruments like Autism Diagnostic Observation Schedule – G (ADOS-G) there are certain pre-requisite conditions to be fulfilled e.g., an experienced licensed clinical psychologist, who is certified both to administer and train others in ADOS-G is required and in supplement to this, English speaking population (child and mother) is also mandatory which cannot be addressed properly in certain settings like India and other low and middle income countries. This is just tip of iceberg. Hence there is an urgent need to develop appropriate instruments for all neurodevelopmental disorders for low and middle income countries including India.

4. Treatment and Preventive Measures

The magnitude of neurodevelopmental disorders burden is not matched by the size and effectiveness of the response it demands. In spite of high rates of neurodevelopmental disorders they are preventable and treatable. According to World Health Organization (WHO) up to 70% of people with epilepsy can be seizure free when treated with simple, inexpensive anticonvulsants. With the preventives in place, it is possible to reduce or post-pone the ailment that one would have suffered from. It is also made more urgent by the growing body of research that intensive early intervention in optimal educational settings results in improved outcomes (4, 5). Furthermore, early identification also enables provision for family supports, reduction of family stress and delivery of appropriate medical care to the child (6). Hence there is a need for early identification of these disorders.

Although the burden of neurodevelopmental disorders is not known along with lifelong consequences but based on best available data actions can be taken as early as possible to control this still unrecognized epidemic, otherwise compensating for missed opportunities often requires extensive and expensive interventions. Till date there is no single best treatment package available for all children with neurodevelopmental disorders. So the preventive measures have prime importance in reducing the burden of neurodevelopmental disorders. How to Prevent Neurodevelopmental Disorders? The answer is not a simple one but a multidisciplinary approach is needed to combat this menace. To battle neurodevelopmental disorders effectively, we must fully understand its patho-physiology, epidemiology, diagnosis and interventions. The varied presentations of neurodevelopmental disorders continue to challenge epidemiologists/public health experts, psychiatrists, paediatric neurologists, paediatricians and psychologists. Besides this, the available government services for these disorders are being poorly utilized. On the other hand, people utilized the services of other agencies, resort to harmful practices and keep on visiting shamans/faith healers because they believe that these conditions are due to evil spirits, hence worsen the conditions.

Stigma, discrimination and neglect are preventing care and treatment reaching to the masses. We need to open up and shed our inhibitions about neurodevelopmental disorders, if the country is to turn the tide against these conditions. Hence, there is an urgent need of capacity building for identification, treatment and prevention of neurodevelopmental disorders in the community as well as in the clinical settings and also neurodevelopmental disorders' literacy needs to be augmented strongly in the community through awareness programs. The Governmental and Non-governmental Organizations have a wonderful opportunity to spread the knowledge relating to neurodevelopmental disorders in resource constraint settings because increased awareness of neurological disorders should help health care planners and the neurological community for setting appropriate priorities in research, prevention and management of these conditions.

5. Research on Neurodevelopmental Disorders

Regardless of impressive progress in neuroscience research, disparities in neurological health and research capacity, particularly in resource constraint societies remain, raising the question of how to encourage neuroscience research and collaboration that benefits the developing world. Even when we come across about some exciting possibilities in the world of neurodevelopmental disorders research, the scene in India does not look very encouraging. The reason may be i) health services suffer from systemic problems limiting the efficient use of resources, ii) Government health care delivery is weak in terms of untrained/less trained staff and iii) above all support for neurodevelopmental research is lacking. It is further compounded by limited capacity for public health relevant research and weak surveillance systems lead to serious information gaps, which impede policy and imperil programmes and also researchers may not always get the luxury of competent statisticians and loads of data can go unpublished for want of reasonable statistical expertise. The budgetary allocation for neurodevelopmental disorders is inadequate and if funds are available not efficiently utilized due to the shortage of appropriately trained personnel for public health delivery and lack of skilled Health System Managers. Hence there is an urgent need of i) neurodevelopmental disorders operational research to understand the nitty-gritty of these conditions in our setting, ii) appropriate training of Public Health Professionals, iii) improved health management and information system, iv) integration of preventive / public health and curative services and v) to frame national policy and launch national health program for neurodevelopmental disorders. The vital goal of the national health program should be health services towards community-based treatment and care, where children can be effectively treated and integrated into society because every child counts.

Apart from some really encouraging signs of progress in this field still it is important as a State / Country to see that there are things that Government can do, that parents can do, and that institutions can do to make measureable differences for these differently abled children. As regards the importance of timings to an initiative to combat neurodevelopmental disorders it was noted, "You can pay now otherwise you have to pay heavily later.

6. Conclusion

Based on available data actions can be taken as early as possible to control this still unrecognized epidemic. Action are i) neurodevelopmental disorders operational research for understanding the nitty-gritty of these conditions in our setting, ii) appropriate training of Public Health Professionals, iii) improved health management and information system, iv) integration of preventive / public health and curative services and v) to frame national policy and launch national health program for neurodevelopmental disorders. In our opinion it must be collective efforts of Government, Donors and parents to make measureable differences for these differently abled children.

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Original Article

Anemia in Type 2 diabetes-Its occurance and relashionship with duration of diabetes: A pilot study

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Abstract:
Introduction: In India most diabetic patients are not investigated for anemia until appearance of clinical features of renal involvement. Also reports on relationship of duration of diabetes on the occurrence of anemia are scarce. The aims of this study were to compare the occurrence of anemia in diabetics without overt features of renal pathology with non-diabetics and to analyze the effect of duration of diabetes on severity of anemia.
Methods: Total 398 subjects with 205 diabetics (125 males and 80 females) and 193 (113 males and 80 females) non diabetics with controlled blood glucose, normal urea, creatinine reports, with or without hypertension were included. Duration of diabetes was noted. Haemoglobin was estimated by cyanmethemoglobin method.
Results: The frequency of occurrence of anemia was 46 % and 52.5 % in diabetic males and females respectively. Hemoglobin levels in males were 12.6 and 13.8 g/dl ($p=<0.001$) whereas in females 11.6 and 11.9g/dl in diabetics and nondiabetics respectively ($p>0.05$). The earliest duration of diabetes which could affect hemoglobin significantly was 4 years in males and 8 years in females.
Conclusion: Screening for anemia in diabetics at least after 4 years of diabetes even without clinical features of renal insufficiency may improve the quality of life and moderate the progression of microvascular complications.

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Keywords: Diabetes; Anemia; Duration; Occurrence; India

1. Introduction

With respect to the global prevalence the greatest absolute increase in the number of people with diabetes will be in India with a projected estimate of 79.4 millions in the year 2030 from 31.7 in 2000 (1). The prevalence of diabetes among adults in the southern states of India has been reported as being 18.6 % in urban populations and approximately 10% in rural populations (2, 3). With the prevalence rate increasing in the younger age groups (4, 5) the long term complications of diabetes can be expected to occur during their productive years causing severe economic and social burden (6).

Another chronic condition which affects the quality of life is anemia. The occurrence of anemia in diabetics was earlier attributed to renal pathology but studies have shown that anemia develops earlier in patients with diabetes when compared to patients with renal involvement due to other causes (7). Observational studies also indicate that low hemoglobin levels in diabetics may increase risk for progression of kidney disease and cardiovascular morbidity and mortality (8, 9). The Reduced hemoglobin levels independently identify diabetic patients with an increased risk of microvascular complications, cardiovascular disease and mortality. Moreover diabetics who already have reduced exertional capacity, poor wound healing or co-morbid vascular disease, anaemia constitutes an unwelcome additional burden. Correction of anemia certainly improves performance and quality of life in diabetic patients (10). In India most patients are regularly assessed for their diabetic status but they are not investigated for anemia until the appearance of clinical features of renal involvement. Studies have shown that in

selected populations, the prevalence of anemia may be higher (7). Also reports on relationship of duration of diabetes on anemia are scarce. Thus this study was done to assess the occurrence of anemia in diabetics without overt features of renal pathology who regularly attend the hospital for blood glucose estimation. It was also done to analyze the effect of duration of diabetes on severity of anemia and also if the there are differences between diabetics with and without hypertension.

2. Materials and Methods

The study was conducted in Vydehi Institute of medical sciences, Bangalore and Sri Devaraj Urs medical college kolar, Karnataka. Blood Samples from diabetic subjects were collected by simple random sampling method from known diabetics attending diabetic clinic and medicine outpatient department .Non diabetics from the same population group were used as controls. The total sample size in the pilot study was 398 with 205 diabetics (125 males and 80 females) and 193 non diabetics (113 males and 80 females). The inclusion criteria consisted of adult type 2 Diabetic males (>20 years) with controlled hypertension or without hypertension. The subjects had their fasting and post prandial glucose, blood urea and creatinine reports within normal levels. They were not having any other overt features of renal involvement or any other complication of diabetes which was assessed by history and general physical examination. They also did not have any reports of hemoglobin estimation within the past 2-3 years. The duration since diagnosis as diabetic was noted.

Haemoglobin concentration of each sample was determined using direct measurement of cyanmethemoglobin, the conventional spectrophotometry method which is the gold standard and is used as reference for other methods (11). The cut off levels for hemoglobin was 13g/dl for males and 12g/dl for females as per WHO standards (12). The study was done with institutional ethical committee approval and informed consent of subjects. Analysis was done using SPSS -16. Significance value taken was $p \leqslant 0.05$. Independent t test was done to compare mean hemoglobin levels between diabetics and non diabetics. Chi square and Z tests were done to find significance value of occurrence of anemia between diabetics and non diabetics. One way ANOVA with post hoc Tukey HSD test and Games Howell test with multiple comparisons table was done to compare hemoglobin means between different durations of diabetes. Correlation analysis was obtained for influence of duration of diabetes and hypertension using spearman correlation and Pearson's test.

3. Results

Of the total 398subjects in the study, 205 were diabetics (125 males and 80 females) and 193 non diabetics (113 males and 80 females). The mean age of diabetics was 55.87 years and that of non diabetics 47.4years. The mean hemoglobin levels and frequency of occurrence of anemia for different levels of hemoglobin was significantly higher in diabetics than non diabetics. But when males and females were separately considered the values were not statistically significant in females (Table 1).

Table 1. Mean hemoglobin and frequency of occurrence of anemia in diabetics and non diabetics

		All subjects (n= 338)			Males (n= 178)			Females (n=100)		
		DM n=205	NDM n= 193	P value	DM n= 125	NDM n= 113	P value	DM n=80	NDM n=80	P value
Mean hemoglobin (g/dl)		12.337 ±1.9	13.438 ±1.7	0.000	12.635 ±1.9	13.802 ± 1.6	0.000	11.59 ±1.6	11.924 ±1.5	0.289
Occurrence of anemia for different hemoglobin levels	<13g/dl	-	-	-	57 (46%)	29 (26%)	0.001	-	-	-
	<12g/dl	75	37	0.000	34 (28%)	5 (4.4%)	0.000	41 (52.5	32 (40%)	0.229
	<11g/dl	61	27	0.000	32 (26%)	3 (2.6%)	0.000	29 (36%)	24 (30%)	0.523
	<10g/d	22	10	0.015	12 (10%)	0 (0%)	0.001	10 (12%)	10 (12%)	1.000

Of the 205 diabetics 75 also had hypertension (43males and 32 females) but there was not much difference in the mean hemoglobin levels between hypertensive and non hypertensive diabetics. The mean hemoglobin was of

12.6g/dl in diabetic males in both with and without hypertension and 11.4g/dl and 11.7 g/dl in diabetic females with and without hypertension respectively.

To find the earliest duration of diabetes which could cause statistically significant low mean hemoglobin levels, different combinations of duration of diabetes were formed as subgroups and multiple comparisons were done for the various combinations. Statistically significant results were obtained with the subgroup combination - up to 4 years, 4-8 years and more than eight years. The results were different for males and females. For males significant lowering of hemoglobin was seen from 4 years of duration of diabetes but for females only after 8 years (Table 2, showing trend in change of hemoglobin with duration of diabetes).

Both Pearson's and spearman's correlation tests showed a significant correlation at 0.01 level for the duration of diabetes with hemoglobin levels which indicates an increase in severity of anemia as no of years of diabetes increases.

Table 2. Mean hemoglobin levels with different durations of diabetes

	Mean hemoglobin g/dl			P value		
	<4 years (group1)	4-8 years (group 2)	>8 years (group 3)	Between group1&2	Between group1&3	Between group2&3
Males	13.312±1.2	11.77±2.0	11.44±2.5	0.001	0.000	0.714
Females	11.868±1.4	12.053±1.3	10.327±1.8	0.922	0.019	0.012

4. Discussions

In this study we have tried to compare the occurrence of anemia in diabetics without clinical features of renal pathology with non diabetics and also correlate the duration of diabetes with the occurrence of anemia in diabetics. In a recent Chennai based study prevalence of anemia in diabetics has been shown to 12.3 % in both males and females (13). But in this study it was much higher with 46 % and 52.5 % in diabetic males and females respectively. When compared with non diabetics the occurrence of anemia was significantly higher in diabetic males than in non diabetics (46% and 26% respectively p=0.001). In females occurrence of anemia in diabetics was not statistically significant when compared to non diabetics (52% and 40% p=0.229) even though percentage of occurrence was greater than male diabetics. The statistical non significance could be due to the fact that prevalence of anemia as such was high even in non diabetic females (40%) when compared to non diabetic males (26%). The high prevalence of anemia in females correlates with other reports as in the WHO report which gives the prevalence of anemia in South East Asian women as 41.9 to 49.4% (14). Another study on the burden of anemia in south Indian females gives the prevalence as 49.5 % (15). The WHO country office for India report on the prevalence of anemia gives the prevalence for males in India as 24% which also relates well with the finding of this study (16). Many factors have been suggested as the reason for anemia in patients with diabetes, including autonomic neuropathy (17), systemic inflammation (18), and changes in the renal tubulointerstitium disrupting the interaction between interstitial fibroblasts, capillaries and tubular cells required for normal hemopoietic function (19).

A study of diabetic patients without nephropathy showed a different picture in terms of Erythropoetin(Epo) response where the investigators had demonstrated a normal expected increase in Epo production in response to lowering levels of Hb in diabetic patients in the absence of nephropathy. This is in contrast to the characteristics of anemia associated with diabetic nephropathy where EPO deficiency is considered to be the main cause of anemia (20, 21). Another review report suggests Erythropoietin Hyporesponsivness which is defined clinically as a requirement for high doses of erythropoietin in order to raise blood Hb level in the absence of iron deficiency as a cause for anemia in diabetics. It is believed to represent impaired antiapoptotic action of erythropoietin on proerythroblasts. Possible causes of this erythropoietin hyporesponsiveness include systemic inflammation and microvascular damage in the bone marrow (22). There is also a possibility of anaemia-sensing (rather than erythropoietin secretory) mechanisms as dysfunctional at a local level in the anaemia of diabetes (7).

In the present study we found a significant correlation (p=0.01) between duration of diabetes and severity of anemia in both males and females. The earliest duration after which there is a significant fall in hemoglobin was 4 years in males (p=0.001) and 8 years in females (p=0.019). The Chennai based study reports a duration of 5 years of

diabetes as an independent predictor of anemia and their data also shows a significant variation only in males and not in females (13). One possible explanation for males having a earlier significant reduction in hemoglobin levels is that Low testosterone levels and hypogonadotropic hypogonadism are common in men with type 2 diabetes (4, 5) and more common than in the age-matched general population (6). As testosterone stimulates erythropoiesis (7) low testosterone levels may also contribute to anaemia in men with type 2 diabetes (23, 24). The results of this study show no significant differences in occurrence of anemia between hypertensive and nonhypertensive (p=0.67) diabetics. This further substantiates the fact that diabetes can cause anemia before renal involvement whereas with hypertensives, anemia is usually associated with renal insufficiency or uncontrolled hypertension (25). In this study there is a significant correlation with age and hemoglobin levels (p= 0.01) in both diabetics and nondiabetics which corresponds to the findings of other studies (26).

5. Conclusion

As per the present study anemia occurs in approximately 45-50% of diabetics and the severity significantly increases after 4 years of duration in males. As anemia is a key indicator of renal pathology and occurs early in diabetics all diabetics need to be screened for anemia at least after 4 years of diabetes even if there are no clinical features of renal insufficiency. This will improve the quality of life in diabetics and also moderate the progression of microvascular complications.

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Original Article

Cardiovascular autonomic function tests in type 2 diabetes mellitus with micro albuminuria

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Abstract:
Introduction: Cardiovascular disease is the leading cause of death in type2 diabetes (DM). Microalbuminuria (MA) is strongly associated with cardiovascular complications in type2 diabetes. Impaired cardiovascular autonomic function and increased albumin excretion are related in patients with diabetes. So this study is designed to investigate the relationship between cardiovascular autonomic function and microalbuminuria in type2 diabetes.
Methods: The study comprised of 180 subjects of age group>50 years, classified into 3 groups of 60 subjects each. DM without MA, DM with MA and controls. The tests performed were 1) Heart rate response to deep breathing, valsalva maneuver and standing; 2) Blood pressure response to standing and to sustained handgrip. Individual tests were given score of 0, 1, or 2 and an overall autonomic test score of 0-10 was obtained.
Results: Mean autonomic score in control, DM without MA and DM with MA are 1.97 ± 0.81, 5.73 ± 1.26 and 7.00 ± 1.80 respectively. The Coefficient of variation (%) of control, DM without MA, DM with MA is 41.1, 21.9 and 25.7 respectively. A significant difference in autonomic score was observed in the DM without MA (P<0.01) and DM with MA (P<0.01) when compared to controls.
Conclusion: In conclusion type2 diabetic individuals should be diagnosed early to prevent disease progression to microalbuminuria and thus minimize complications.

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Keywords: Cardiovascular autonomic function; Microalbuminuria; Type2 diabetes

1. Introduction

Diabetes mellitus is a metabolic disorder of multiple aetiology characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism due to absolute or relative deficiency of insulin. The increased morbidity and mortality is due to its complications like neuropathy, nephropathy, and retinopathy etc, especially seen in 40 to 60 years age group. The prevalence of diabetes is rapidly rising all over the globe at an alarming rate. Cardiovascular disease is the leading cause of death among patients with type2 diabetes. The presence of cardiovascular autonomic neuropathy has been associated with substantially increased risk of cardiovascular and all-cause mortality in type2 diabetes. Quantitative cardiovascular autonomic function tests are widely used to detect, verify and quantify the cardiovascular autonomic dysfunction. They have been tested for their validity and reliability. These tests are performed since the procedures are straight forward, reproducible and non invasive.

Microalbuminuria, defined as the elevation of urinary albumin excretion in the range of 30 to 300 mg/24 h, is strongly associated with endothelial dysfunction which increases the risk of nephropathy and cardiovascular complications, including atherosclerotic coronary disease, stroke, peripheral vascular disease and cardiovascular mortality in diabetes. Several studies have suggested that impaired cardiovascular autonomic function and increased albumin excretion are related in patients with diabetes.

Patients with both diabetic nephropathy and autonomic neuropathy have a higher mortality than patients with nephropathy and normal autonomic function. Earlier studies have suggested that patients with cardiovascular autonomic neuropathy have a higher prevalence of microalbuminuria than patients without cardiovascular autonomic neuropathy. So this study aims at evaluating the association of cardiovascular autonomic functions as assessed by Quantitative cardiovascular autonomic function tests with microalbuminuria in type2 diabetes mellitus of age group more than 50 years.

2. Materials and Methods

2.1. Subjects and Methods

The study comprised of 180 subjects of age group>50 years. The presence of diabetes was detected by random plasma glucose>200 mg/dL. The presence of microalbuminuria was detected by colorimetric end point test using Pyrogallol red reagent. The subjects should not be suffering from any cardiovascular diseases. They should not be on drugs altering renal function and autonomic functions. They were classified into 3 groups of 60 subjects each.

- Type2 Diabetic mellitus patients without microalbuminuria
- Type2 Diabetic mellitus patients with microalbuminuria
- Control group consisting of age matched healthy subjects

The subjects were instructed not to have coffee, tea, cola 12 hours before the tests and were asked to have light breakfast two hours before the tests. The subject was asked to relax in supine position for 30 minutes. The resting heart rate was recorded on a standard ECG from lead two. Blood pressure(BP) was measured with sphygmomanometer. The cardiovascular tests performed are detailed below in the order of execution. These tests were demonstrated to the subjects.

2.2. Procedure of autonomic evaluation as described by Ewing & Clarke

2.2.1. Deep breathing test

In the sitting position subject was asked to breathe quietly and deeply at the rate of 6 breaths per minute. A continuous ECG was recorded for six cycles. The maximum and minimum R-R intervals were measured during each breathing cycles and converted to beats per minute. The result was then expressed as mean of the difference between maximum and minimum heart rate for six measured cycles in beats per minute (1). Deep breathing difference (DBD) =Mean of heart rate differences in 6 breath cycles.

2.2.2. Heart-Rate variation to Valsalva Maneuver

The subject was seated comfortably and was asked to blow into a mouthpiece connected to a mercury sphygmomanometer and holding it at a pressure of 40 mm of mercury for 15 seconds, while a continuous ECG was being recorded. The ECG was continued to be recorded after release of pressure at the end of 15 seconds for 30 seconds. The heart rate changes induced by the valsalva maneuver was expressed as the ratio of the maximal tachycardia during the maneuver to the maximal bradycardia after the maneuver. This ratio was defined as the Valsalva ratio and was calculated as the ratio of maximum R-R interval after the maneuver to minimum R-R interval during the maneuver (1). Valsalva ratio(VR)= maximal tachycardia/maximum bradycardia= maximum R-R interval/minimum R-R interval.

2.2.3. Heart rate response to standing (postural tachycardia index)

The subjects were asked to lie on the examination table quietly while heart rate is being recorded on ECG. They were then asked to stand-up unaided and ECG was recorded for 1 minute. The shortest R-R interval at or around 15th beat and longest R-R interval at or around 30th beat was measured (1). The result was expressed as:
PTI= Longest R-R interval at 30th beat / shortest R-R at 15th beat.

2.2.4. Blood Pressure Response to Standing (Orthostatic test)

The subject was asked to rest in a supine position. The resting BP was recorded. The subject was then asked to stand unaided and remain standing unsupported for 3 minutes. The BP was recorded at 30 seconds and 3 minutes after standing up. The difference between the resting and standing BP levels was calculated. The fall in systolic BP at 30 seconds on standing noted (1).

2.2.5. Blood Pressure Response to Sustained Handgrip

The patient was asked to compress the inflated blood pressure cuff to the maximum possible extent with one hand and reading on manometer was taken. The patient was asked to maintain the pressure of cuff in such a way

as to keep the manometer reading at 30% of maximum force for a period of 3 minutes. The maximum reading of the diastolic blood pressure was recorded during the procedure. Then the rise in diastolic blood pressure was calculated by subtracting resting diastolic blood pressure from this value. The interpretations of these tests are according to norm adopted by Ewing and Clarke (2).

3. Results

Mean and SD of autonomic score in control, DM without MA and DM with MA are 1.97 ± 0.81, 5.73 ± 1.26 and 7.00 ± 1.80 respectively (Table 1). The CV (%) of control, DM without MA, DM with MA are 41.1, 21.9 and 25.7 respectively. There was a significant increase in autonomic scores in DM without MA, DM with MA when compared to control. Autonomic scores were significantly increased in DM without MA when compared to control. The DM with MA group differ statistically from DM without MA group in autonomic scores (P<0.01). The DM with MA group differ statistically from control group in autonomic scores (P<0.01). A significant difference in autonomic score was observed in the DM without MA and DM with MA groups when compared to controls (Table 2).

Table 1. Mean, Standard deviation(SD) and coefficient of variation(CV) of autonomic score in the 3 study groups

	AUTONOMIC SCORE		
Groups	Mean	S.D.	CV(%)
Control	1.97	0.81	41.1
Diab MA –ve	5.73	1.26	21.9
Diab MA+ve	7.00	1.80	25.7

Table 2. One way ANOVA to compare mean of autonomic score between 3 study groups

	Control	Diab MA-ve	Diab MA+ve	Inference
Mean	1.97	5.73	7.00	F=112.63
SD	0.81	1.26	1.80	P< 0.01

4. Discussions

Microalbuminuria is associated with adverse health outcomes in adults. Studies of persons with diabetes have shown that those with microalbuminuria are at increased risk for renal progression and excess cardiovascular disease morbidity and mortality. Microalbuminuria is useful marker of generalized endothelial cells dysfunction and mortality in NIDDM patients and is related to its renal and cardiovascular sequelae (3). Other studies indicate that microalbuminuria may precede the onset of non-insulin-dependent diabetes and is linked to aberrations in glucose and insulin metabolism, even in the absence of diabetes. These research findings suggest that microalbuminuria may be an important risk marker in the general adult population. In diabetes, microalbuminuria is associated with a cluster of metabolic and hemodynamic abnormalities, including impaired glucose tolerance, a disadvantageous lipid profile, uric acid disturbances, insulin resistance, and altered diurnal blood pressure rhythm (4).

Cardiovascular autonomic neuropathy (CAN) result from damage to the autonomic nerve fibers to the heart, and the earliest indicator of CAN is a decrease in heart rate variation (HRV) during deep breathing. Autonomic neuropathy commonly coexists with established diabetic nephropathy (5). Much of the disease burden in diabetes occurs in patients with diabetic nephropathy, as they have the highest chance of developing cardiovascular disease as well as severe retinopathy and neuropathy (6). Patients with diabetic nephropathy constitute a population with a high risk of CVD and early death compared with patients without albuminuria. Microalbuminuria has emerged as an important risk factor for left ventricular hypertrophy, myocardial infarction, stroke, peripheral

vascular diseases and retinopathy independent of blood pressure. This suggests that cardiovascular autonomic impairment may be involved in the pathogenesis of diabetic renal disease through mechanisms independent of blood pressure. Dysfunction of the vascular endothelium causes both microalbuminuria and cardiovascular disease (7). In type 2 diabetes, endothelial dysfunction (ED) is present from the onset of the disease and is strongly related to adverse outcomes (8). In addition, hyperglycemia can alter the charge selectivity of the glomerular capillary wall, thereby increasing its permeability. The glycocalix that fills the endothelial fenestrae seems to be important for glomerular size and charge selectivity (9, 10). Abnormalities in the endothelial glycocalix may contribute to microalbuminuria but also have been implicated in the pathogenesis of atherosclerosis, thus providing a potential direct link between albuminuria and cardiovascular disease (11).

5. Conclusion

This study suggests that cardiovascular autonomic function declines in type2 diabetes patients, the severity of which is related to the presence of microalbuminuria. The findings are consistent with the hypothesis suggested that impairment of autonomic function leads to increased renal blood flow, glomerular hyperfiltration, and sodium excretion, all of which accelerate progression to diabetic microalbuminuria. Alternatively, the metabolic and vascular changes associated with diabetes may adversely affect both renal and cardiovascular autonomic function through other mechanisms. So type2 diabetic individuals should be diagnosed at an early stage in an attempt to prevent disease progression to microalbuminuria and thus minimize the burden of diabetes associated complications.

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Original Article

Investigation of Upper Limb Disorders and its Relationship with Physical Working Requirements among metallic industry Workers

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Abstract:
Introduction: Musculoskeletal disorders, premature tiredness caused by work and so on are arisen from different requirements of every job. According to the statistics provided by the World Health Organization (WHO), the most important cause of the loss of working time is the prevalence of musculoskeletal disorders in work environments.
Method: A cross sectional study with randomized sampling was conducted to determine the relationship between the physical work requirements and upper limbs disorders such as shoulders, wrist, elbow, and hand. data was gathered by using of a questionnaire consist of demographic data and TMW (Tools for Modified Work) for physical work requirement and Maastricht Upper Extremity Questionnaire for upper limbs musculoskeletal disorders.
Results: Results showed that there was significant relationship between musculoskeletal disorder and the physical work requirements. In other words musculoskeletal disorders in all upper limb have been increased by deficiency in providing the physical work requirement
Conclusion: This study confirmed that physical work requirement has a crucial role in musculoskeletal disorder especially in upper limbs. And it is essential to give full attention to provide standard requirements for workers.

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Keywords: Physical work requirement; Musculoskeletal disorder; Upper limb; Metal product

1. Introduction

Nowadays, there are myriads of workshops, small to large, in the field of industry. According to the statistics provided by the World Health Organization, about %58 of the world older-than-ten persons spend one third of their time in these places, while only 5-10 percents of workers in the developing countries have access to occupational health services (1, 2). Musculoskeletal disorders are the second most important health problems among workers, and are considered as the main cause of lost of working time, increase in costs, and damages to the human labor force (1, 2). This indicates the high importance of the musculoskeletal disorders in work environments. These disorders happen in any industrial work, and physical work requirements are one of the factors effective in prevalence of such disorders, which treat those who have not enough physical power more than others (1, 3). According to the results of the previous studies, despite the wide spread of mechanized and automated procedures, musculoskeletal disorders arisen from work are the major cause of lost of working time, increase in costs, and damages to the human labor force (4, 5, and 6). Musculoskeletal disorders emerge in the spinal column, upper limb and lower limb. These disorders may have been caused by long-term exposure to their causing factors, gradually and during a long procedure, or they may have been caused suddenly by a forceful shock on some part of the musculoskeletal system (1, 7, 8, 9, and 10). Physical requirements of work were evaluated in a group of workers. Through comparing the workers who did not display any musculoskeletal symptom with those workers who showed theses symptoms, the effects of the physical requirements of work were investigated after controlling factors such as emotional requirements, wrong method and the amount of work, violence, and social supports on the job (11).

According to a study performed by Moor et al. in Canada in 1992, musculoskeletal disorders, with an annual cost of $17.8 million, are placed after cardiovascular diseases, which cause $19.7 million annual losses (4).

Meeting physical requirements of a work is necessary to perform it. These physical requirements may cause musculoskeletal disorders by hurting some parts of body, specially waist, shoulders, neck, elbow, hand, and wrist (12). In this study, physical requirements of workers employed in metal industries, which include cutting and reforming of metals and also general workshops of metal industries, have been investigated and examined for any possible relationship with musculoskeletal disorders of the upper limb.

2. Material and Methods

This research was a Cross sectional study. Sample included workers in the workshops of metallic products in Ilam, a city in the west of Iran. The sample was selected through sampling with the simple random method. The sample population was calculated using the below equation, and it was calculated to be 169:

$$n = \frac{NZ^2P(1-P)}{(N-1)d^2 + Z^2(1-P)}$$

N: Total number of the workers employed in the workshops of metallic products in Ilam city.
Z: 95% confidence interval coefficient, which is equal to 1.96
P: An estimation of the relative frequency of musculoskeletal disorders among workers, which was taken equal to 0.5 due to their diversity in order to get the highest sample volume.
D: The degree of precision, which is taken equal to 0.05.

In this study, the upper limb disorders were detected using Maastricht Upper Extremity Questionnaire (MUEQ). After that, for each worker, the evaluation for the physical requirement of the work, considering organs one by one (neck, shoulder, arm, hand, and wrist), was filled out using Tools for Modified Work (TMW) method and the physical requirements of the considered job was estimated. Then the collected data were entered to SPSS software and in order to examine the relationship between disorders of the upper limb with physical requirements of work among workers. The SPSS version 11.5 (SPSS Inc. Chicago, Illinois, U.S) and X2 statistical test was used for data analysis.

3. Results

The subjects were all male with average age of 33.6 years (from 19 to 51 years) and the average length of employment period was 7.35 years. Frequency and classification of physical requirement around to neck were summarized in table one there is a significant relationship between Physical requirement to neck and frequency of musculoskeletal disorders (P-value =0.03). Frequency and classification of physical requirement around to shoulders were summarized in table there is a significant relationship between Physical requirement to neck and frequency of musculoskeletal disorders (P-value =0.04). Frequency and classification of physical requirement around wrest and elbow were summarized in table one and four there is a negative significant relationship between Physical requirement to wrest and elbow and frequency of musculoskeletal disorders (P-value =0.03). Frequency and classification of physical requirement around to hand was summarized in table one there is a significant relationship between Physical requirement to hand and frequency of musculoskeletal disorders (P-value =0.03).

4. Discussions

In this study, result showed that there is a significant relationship between physical requirement and neck musculoskeletal disorder. These results are consistent with the results provided by Trinkhoff (10). In his work, 1163 nurses were investigated and the results showed that the measured physical requirement has been significantly accompanied by disorders around neck, shoulders, and waist (10).

Likewise, in a study performed by L. Karlqvist, 234 women and 953 men among ambulance and emergency personnel were randomly selected and studied using self-reporting questionnaire (3). In that study, factors related to the work and its physical requirements were investigated, and the results showed that the physical requirements of persons are related to work limitations which are caused by musculoskeletal disorders in the neck area (3). In addition, the relationship between physical requirements of work with musculoskeletal disorders of shoulder among the studied workers showed that the relationship was significant. According to Table 1, among all of the studied workers (169 persons), 139 persons have had musculoskeletal disorders, out of which 119 persons have had medium and high physical requirements and 20 persons have had low or no physical requirements. These

results are consistent with the results of a study performed by other research (7, 10, 11, amd 13). According to the Fredriksson, 1663 English and Spanish workers were studied, and the frequency of neck and shoulder disorders were determined to be %10.7 and %9.5, respectively. In addition, there has been a significant relationship between physical requirements of work and the prevalence of these disorders (7).

Table 1. Frequency and classification of physical requirement around neck, shoulders, elbows, wrist and hand

		Physical requirement to neck		**Total**
		No or low physical requirement	Medium or high physical requirement	
musculoskeletal disorders	Yes	19(32%)	40(68%)	59
	No	81(73%)	29(27%)	110
	Total	100(59%)	69(41%)	169
		Physical requirement to shoulders		**Total**
		No or low physical requirement	Medium and high physical requirement	
musculoskeletal disorders	Yes	20 (14%)	119(86%)	139
	No	9(30%)	21(70%)	30
	Total	29	140	169
		Physical requirement to elbows		**Total**
		No or low physical requirement	Medium and high physical requirement	
musculoskeletal disorders	Yes	131(85%)	23(15%)	154
	No	4(27%)	11(73%)	15
	Total	135	34	169
		Physical requirement to wrist		**Total**
		No or low physical requirement	Medium and high physical requirement	
musculoskeletal disorders	Yes	87(60%)	58(40%)	145
	No	9(37%)	15(63%)	24
	Total	96	73	169
		Physical requirement to hand		**Total**
		No or low physical requirement	Medium and high physical requirement	
musculoskeletal disorders	Yes	14(31%)	31(69%)	45
	No	91(73%)	33(27%)	124
	Total	105	64	169

Relationship between physical requirements of work with musculoskeletal disorders of elbow among the studied workers was examined too. Results indicated that there is a significant relationship between these two parameters. According to Table 1, among all of the studied workers, 154 persons have had musculoskeletal disorders around elbow, out of which 23 persons have had medium and high physical requirements and 131 persons have had low or no physical requirements (3, 10).

Relationship between physical requirements of work with musculoskeletal disorders of wrist among the studied workers showed that there is a significant relationship between these two parameters. These results are consistent with the results reported by Mr. Hansson. His study showed that limited physical requirement among hospital workers had significantly increased with higher prevalence of wrist disorders (8). Relationship between physical requirements of work with musculoskeletal disorders in hand showed that there is a significant relationship between these two parameters. According to Table 1, among all of the studied workers, 45 persons have had musculoskeletal disorders, out of which 31 persons have had medium and high physical requirements and 14 persons have had low or no physical requirements in hands. These results are consistent with the results reported by Hansson (8). In his study, 95 women who had been performing repetitive works were investigated. Results showed that the prevalence of disorders in hand, wrist, neck, and shoulder have a significant relationship with physical load of work and physical requirement of work (1, 14).

5. Conclusion

This study confirmed that physical work requirement is a one of the most important factors that is related to musculoskeletal disorder especially in upper limbs. And employer should provide standard requirements in order to prevention of musculoskeletal disorder in workers.

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Original Article

Medical Tourism in Iran: attitude and challenges

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Abstract:
Introduction: Medical Tourism is one of the most important branches of Tourism with many socioeconomic benefits. Medical Tourism refers to traveling to other countries to obtain medical services with lower costs comparing to their own countries. As health tourism is a new subject in Iran, we decided to study the attitude and knowledge of Qom Medical University staff about Health Tourism.
Methods: This descriptive study was done on 250 Medical staff of Beheshti Hospital of Qom Medical University by completing questionnaires, which were divided into 3 parts (demographic information, knowledge and attitude of participants). All of the information was analyzed by SPSS software.
Results: Only 12.8% of participants have studied articles about HealthTourism. The majority (59.2%) believed that Health Tourism development in Iran hasn't any bad social consequence and 47%believed that Health Tourism development in Iran can improve the knowledge of Iranian medical doctors. The majority (56.6%) of participants agreed to the incoming of Health Tourists to Iran and the majority of them (83.6%) believed that development of Health Tourism can improve the treatment of Iranian patients.
Conclusion: The knowledge of participants is very low and so much more educational efforts should be done by the responsible ministries but it seems medical staff's attitude about health Tourism is very good and they can contribute effectively in this field.

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Keywords: Attitude; knowledge; Health Tourism; Medical staff; Qom

1. Introduction

Medical Tourism is one of the most important branches of tourism with many socioeconomic benefits in the world. Health tourism refers to traveling to other countries to obtain medical or surgical treatment with low costs comparing to their own countries. The purpose of this kind of travel is to go on treatment, (whether to get medical treatment or using natural sources), to rest, and take care of body health which it may occur voluntarily or with the advice of the physician (1). Health tourism is categorized as follow:

- Traveling to spas towns and Sanitarium (Mineral and hot water centers) to escape daily routine life fatigue without the intervention and supervision of a physician although they may not have any diseases;
- Traveling for the purpose of using natural sources such as mineral waters, salt, healing mud and others to treat some of the diseases or period of recovery under the observation or intervention of the physician and traveling in order to obtain medical or surgical treatment under the observation of the physicians in hospitals or clinics (2).

Back to pre-historic times, many people visited rivers and hot mineral waters spas for recreation and medical treatment (3). The term spa is derived from the name of the town of Spa in Bulgaria which had mineral and hot water and tourists traveled there to get treatment (2). Many historical Iranian books, especially in Abu Ali Sina Books showed the importance of mineral and hot waters for earlier Iranian. Mineral water springs in different regions in Iran have more than 30 mineral elements (4).

Health tourists are interested to increase the development of their spirit, feeling, and body via traveling (5). The changes of lifestyle in developing countries increased the demand for cosmetic surgeons, spas towns for retired people. Since the number of elderly population is increasing, there is more demand for healing spas because of disorders such as rheumatic and skin diseases (5). Because of long wait list, high-costs of medical services, no medical insurance, and so people are willing to travel to abroad where the costs are lower than in their own countries (6). From the mid of 1990, some factors caused the promotion of health tourism marketing such as health tourism agencies development (8). For example, in Canada, there are at least 15 health tourism companies that work in different cities and many people travel to other countries for treatment for the reasons such as long waiting lists for elective surgeries (9, 10, 11, 12, and 13). Low cost is one important benefit of health tourism in developing countries (14). The patients of the USA can get medical services with 1/4 the costs even 1/10 of the costs outside America (2).

In recent years, the demand for receiving medical services was increased because the number of old population in developing countries has been increased (8). For example in Japan, the health care system cannot handle all the medical demands as the population is getting older, so the country got interested in health tourism. Many of the Japanese companies send their workers to Thailand for yearly medical check- up (15) and also in Canada the delays in surgical procedures are a serious problem and this factor encourage patients to travel to abroad (16). Many people in developing countries are not insured because of the high costs of medical insurance, In America; for instance, about four millions are not insured, so they travel to other countries (14). The high cost of treatments and long waiting periods for insurance approval is also another cause of health tourism promotion (7). In the USA, American patients who are not insured and cannot afford to pay the medical cost in their country, travel to other countries such as Thailand and India to undergo healthcare and wellness treatment (17). Some patients don't want their relatives to know about their treatment, especially about their cosmetic surgery or infertility, so they travel to other countries (18). In some countries, because of the market and the extended advertisements about giving medical care next to tourism have separately goal to travel to this destinations (7). In general, health tourism is in progress in developed countries such as Scotland, Poland, Swiss, Greece, Netherlands, Israeli, The USA, Canada, and in developing countries such as Cuba, Croatia, India, Jordan, Bahrain, Malaysia, Singapore, and Thailand (3). Health tourists are mostly from wealthy countries. The difficult policies for issuing visa to the USA and European countries caused many patients travel to Countries such as Asia for treatment (15). The value of the loan of health tourism in 2006 was more than 56 billion dollar (15). Considering the benefits of health tourism, the law of the 4th development program of Iran considered the increased income of this kind of tourism as a duty of Ministry of Health in Iran. So, Iran took the responsibility to give an amount of 100 Billion Rials in order to promote medical tourism (4). But there are no accurate statistics about foreign patients that are under treatment or those that they attempt to use centers such as water therapy centers in Iran. Therefore taking into account that this industry is new, this study was done to make people to be familiar with health tourism in Iran.

2. Materials and Methods

In 2011, this descriptive study was done in Qom University of Medical Sciences on all of the 250 medical staff by completing questionnaires, which were divided into 3 parts (demographic information, knowledge and attitude of participants). The design of this questionnaire was discussed with the Tourism Management Professors of Allameh University, Tehran, Iran. All of the information was analyzed by SPSS/ software version 15 and descriptive statistical methods were used.

3. Results

This study was done on 250 Medical Staff of Qom University of Medical Sciences. Age mean and standard deviation was 31.82±6.74 years old with the minimum of 20 and maximum 52. The majority (64.4%) was male and 35.6% were female. Only 32 participants (12.8 %) have studied about health tourism and only 18.4% of them heard about health tourism. Totally 41.6% of them had contacted with health tourists. Among them, 40 participants (16%) believed that the tourism responsible organization should be in common between Ministry of Health and Tourism Organization. In the opinion of 79 cases (31.6%) private hospitals are more suitable for health tourism services while 33 cases (13.2%) mentioned that public hospitals are more appropriated and 72 cases (28.8%) both of them. The majority (52%) agreed to provide more facilities to foreign patients. The majority (59.2%) believed that the

development of health tourism in Iran does not have any social destructive effects. The majority (78.3) believed that the entry of health tourists may cause the development of Iranian physicians' knowledge. Between the cases, 45%7 agreed that the professional medical team should be involved in treating these kinds of patients. The majority (84%) believed that almost all Iranian physicians are trustful in the world. About the characteristics of health tourism city centers: (8.8%%) believed that it should have developed hospital equipments, (1.2%) international airport, (1.6%) good climate and (86.8%) believed that all of above are necessary. The majority (80%) agreed the entry of health tourists to Iran and also most of them (80%) believed that the development of health tourism may help the improvement of treatment quality in different cities of Iran.

About the main purpose to attract health tourists in some countries: (9.2%) believed ability to treatment special diseases, (10.4%) positive image of that country in the world, (13.6%) high quality and low costs of medical services and (63.6%) all of the above are the main purposes and also (3.2%) had not any idea. About the professional medical field in order to transform Iran to health tourism center: (8%) general surgery, (7.2%) plastic surgery, (6.8%) water therapy, (48%) all of the professional medical fields and (30%) did not have any idea.

4. Discussions

Recently, health tourism has been more developed in developing countries (7). For example, in India, health tourism is one of the most successful industries following software industry. The present value of health tourism marketing in India is more than $330 Millions and until 2012 it will reach more than $1 billion (19). India was able to attract many health tourists from developed countries in the fields of yoga and massage therapy and it can provide many jobs in health tourism (20, 21). Annually, Jordan has $500 millions and Egypt $400 millions income from health tourism (22). Also Singapore intends to attract 1 million foreign patients and Raffle hospital in Singapore has 50 agents in 12 countries for marketing (23). Well-equipped Hospitals and clinics in Argentina provide medical services to health tourists with fewer costs than in America. (18) Dubai attempts to attract Middle-East medical marketing in accordance with USA and Germany Universities (24).

Iran has some progresses in the field such as kidney and liver transplant, infertility and Invasive radiology techniques in recent years. Annually, thousands of patients die even in developed countries while waiting for kidney transplant. While the life of many patients with kidney transplant with health tourism will be saved (25). In a study that was done by Ghods and Co-authors in Hashemi Center, Tehran reported as follow: 1881 kidney transplant surgeries were done in this center that 1% was refugees, 0.6% were foreigners from Turkey, Japan, Yeman, India, and Azerbaijan and also 0.9% of Iranian Immigrants. The services that were offered to poor foreigners between above patients were very helpful for them. But the income of health tourism in Iran is very low and almost limited to health tourists from countries around Persian Gulf and unfortunately, appropriate advertisements have not been done outside of Iran.

Our study revealed only the minority of the participants has studied about health tourism and also only the minority of them had heard the name of health tourism. It means that cultural efforts in Iran are not significant in this field, whereas Iran has also many tourism attractions. Beside this; Qom attracts many tourists due to the religious reasons every year and with good advertisement we can develop medical tourism in this city. In developed countries, several medical companies facilitated traveling to other countries for health tourism (8, 9, and 10). If Iranian agents contact these kinds of companies, they may be able to perform their activities best. Almost 31.6% of our participants believed that the private hospital services are better for health tourists. Although the qualified services in private hospitals are higher than in public hospitals, however, special qualified wards can be designed in public hospitals. The majority believed that health tourists should utilize medical services more than regional population. Really it is better that we offer more qualified services to health tourists.

The majority of the participants believed that health tourism has not any disadvantage. Really, health tourism has both positive and negative social effects. The advantage of health tourism in developed countries is availability of medical services that are not available in their own country and pressure on their organizations to decrease medical services prices (16). The advantage of health tourism in developing countries is to increase credit incomes, prevent the immigration of Iranian medical specialists and medical services development (3, 14, and15). The disadvantages of health tourism are:

- Regional patients may be neglected (2, 16).
- The real statistics of health tourists are not clear (2).
- The quality of medical services may be obscure, for example the patients who had travelled to China, India and Pakistan to perform transplant had high mortality and morbidity (26, 27).
- In some of the developed countries when the patients go abroad as health tourists, their prior treatment processes would be erupted and their own doctors can not follow them.

- Ethical law and aspects may be obscured, for example in Canada, which is one of the major health tourism costumers, the physicians explain the risks of different kinds of treatments, but in other countries it may not be a rule (16).
- In developing countries health tourism may cause inflation (1). Singapore extends high quality medical schools to become health tourism centers (28).

Actually, the majority of our participants agreed the involvement of high quality personnel in treatment of health tourists. The majority believed that Iranian specialists are trustful in the world, and also the majority believed that entry of health tourists may develop the knowledge of Iranian medical specialists. The majority believed that Iran has good potentials to attract health tourists and the majority agreed to the entry of health tourists and believed health tourism development may improve the quality of treatment in Iran. Therefore, we may have good potentials in Iran and we with the improvement of skills and knowledge of Iranian personnel, we can develop health tourism in Iran, and also we can prevent the immigration of Iranian medical specialists while at the present time, many Iranian medical specialists work in developed countries. Certainly, fluency in different languages and owning language international certification is very important for personnel who are involved in health tourism. For example, in Focket Hospital in Thailand, there are translators of 15 languages and annually they attract more than 20000 health tourists (3). The majority believed that high quality hospital equipments and good climate and international airport are necessary as the characteristic aspects of health tourism centers. Actually all of the above are necessary. For example, a study, which was done in Miami (USA), showed that high quality facilities, good climate and medical care in Miami medical centers attracted health tourists (29).

5. Conclusion

In summary, considering the low knowledge of participants about health tourism, more educational efforts should be done. Language skills should be improved in medical personnel who are involved in health tourism industry. The relations between Iran and foreign hospitals and medical agencies should be stronger. The finance assistance for health tourism centers establishments should be increased. Hot water spas should be developed in Iran.

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Case Report

Langerhans Cell Histiocytosis (LCH) and Diabetes Insipidus with Mandibular lesion

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Abstract: Langerhans cell histicytosis (LCH) is a rare disorder that primarily affects children. Its occurrence in adult is very rare. We report a case of 42 year old female patient who presented polyuria and polydipsia, loosing teeth and diplopia added to symptom .The diagnostic workup revealed endocrine involvement with diabetes insipidus. The x ray Orthopantomogram (OPG) showed destructive bone lesion of mandible. Biopsy of lesion revealed histiocytosis X. We herein describe the case report of Langerhans cell histiocytosis on mandible and involvement endocrine system.

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Keywords: Langerhans cell histicytosis (LCH); Diabetes insipidus (DI); Mandibular lesion

1. Introduction

Langerhans cell histiocytosis (LCH) is a rare disorder characterized by the excessive proliferation of Langerhans cells in various tissues. LCH places in the mononuclear phagocyte system and can infiltrate almost any place of the body. LCH be presented as a localized lesion or extensive systemic disease (1–3). The clinical manifestation of LCH is extremely, Patient may suffer single system or multisystem involvement. Presenting symptoms in order of frequency are skin rash, dyspnea, polydipsia and polyuria (diabetes insipidus/DI), bone pain, lymphadenopathy, gingival ulcer, and memory disorders. The incidence of LCH appears to be 3 to 5 per million children and in adult it is estimated 1 to 2 cases of LCH occur per million populations (4). The etiology of LCH is unknown; some studies suggested that the etiology may be related to immunological abnormalities resulting from a suppressor cell deficiency (5-6) and other efforts to define a viral etiology have not been successful (6-7). Dibetes insipidus (DI) is the most common endocrine abnormality in LCH; 4 % of LCH may present with an apparent idiopathic presentation of DI previous to other lesions are recognized (8). Of 47 adult patients in one study, the primary sites of bone involvement were Jaw (30 %), skull (21 %), vertebral (13 %) (9). Pain and bony swelling are the most commonly presenting complaint. Intraoral findings include gingival ulcer (50%), loosening teeth (17%) and premature exfoliation of the teeth, precocious eruption of permanent dentition, ectopic eruption of permanent molars and halitosis (5, 10, and 11). Histological confirmation is necessary for diagnosis. Because endocrinology manifestation in LCH relatively is rare, we report a case of an Iranian adult patient suffering from LCH on jaw and DI.

2. Case Presentation

The patient was a 42 years old housewife presented with polyoria, polydipsia and nocturia since 14 years ago. Central DI (Diabetes insipidus) was treated with nasal spray desmopressin acetate (DDAVP) 2puf /daily and symptom temporarily resolved .Two year later treatment patient developed amenorrhea and consequently presented with loos mandibular teeth which subsequently extracted.

The X-Ray (OPG) examination (Figure1) and CTscan (Figure2), showed destructive bone lesion of middle mandible .family history were unremarkable.last pregnancy of LCH patient was terminated by cesarean section 14

years ago she did not experience unusual bleeding. Three months after delivery she was able to breast feed. Seven years after first presentation the patient was suffer from Diabetes Mellitus that was treated with hypoglacemic oral agents. Diplopia gradually added to the symptoms.

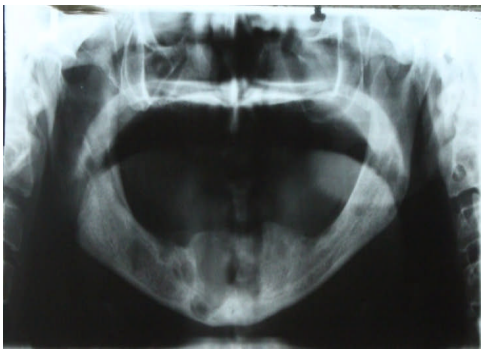

Figure 1. The X-Ray (OPG): (showed destructive bone lesion of middle mandible

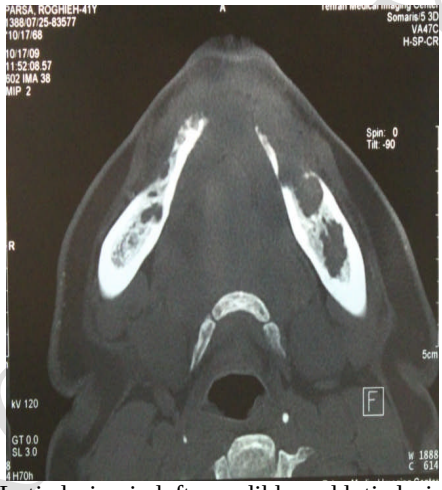

Figure 2. CTscan Axial view. Lytic lesion in left mandible and lytic lesion in medial ramus of mandible

In Physical examination, the superficial lymph nodes were not palpable and no hepatosplenomegaly was noted. There were no abnormalities of cardiac or pulmonary function, Neurological examination at that time, revealed diplopia and bitemporal visual field defects. Hematological data including Complete Blood Count, Electrolytes ,Blood Urea, Nitrogen, Creatinin Erythrocyte Sedemination Rate were whitin normal limits , Fasting blood sugar:115mg/dl, HbA_1C:5.5 (4/4_6/7), Endocrinological test revealed the following values: T4 [Tetroiodothyronine: 7.1µ gr/dl (4/6-12/4)], TSH [thyroid stimulating hormone 0.3mIU/ml (0/1-5)], T3 [Triiodothyronine: 113ng/100ml (78-182)], Prolactin 9.4ng/ml (2-13), MorningCortisolin: 5µgr/dl (9/4-26), Luteiniing hormone 0.5 mIU/ml (13/5-96), Follicle stimulating hormone1.1 mIU/ml (27_129), Stradiol: 27Pmol/ml.

As mentioned in OPG showed a destructive bone lesion on middle mandible and 2 lesions on left ramus. After biopsy the lesion was resected totally by a maxillofacial surgeon. Biopsy of lesions demonstrated presence of proliferation histiocytic cell and positive for S100 proteined CD_{19} indicated Langerhans cell histiocytosis (histiocytosis X). Bone scan showed increase activity in mandible due to infiltration lesion, focal lesion in distal part of right femur, suspicious lesion in the right parietal bone. Brain MRI with contrast showed: enhancement lesion in suprasellar 10×5mm which is attached a chiasma that can be associated with histiocytosis (Figure 3).

Prednisolone (PSL) gradually was started and tapered and then12 cycles of chemotherapy with vinblastine were given every 3 weeks for two days. During chemotherapy proteinuria occurred based on consultation with the

nephrology service and according to Renal Ultra Sonography which was normal and membranoglomerulopathy was reported in biopsy, previous treatment to continue were recommended. After completing chemotherapy, she underwent radiotherapy for 12 sessions. Follow-up 6 months after radiothrapy showed no recurrence or evidence of systemic involvement.

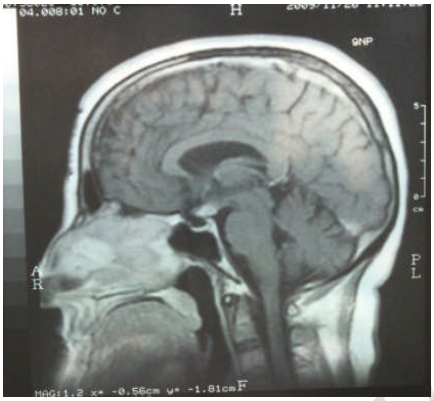

Figure 3. Brain MRI inhacment lesion in suprasellar 10×5mm which is attached a chiasma that can be associated with histiocytosis

3. Discussions

LCH is very rare and multifaceted that includes Letter-Siwe disease, Hand-Schuller-Christian disease and eosinophilic granuloma (EG). LCH may be systemic or localized the pathogenesis and etiology of LCH remains as uncertain. Finding positive markers in lesional cells, e.g S-100 Makes definitive diagnosis of the disease. LCH endocrine manifestation are involvement hypothalamus, Pituitary, thyroid gland, pancreas. It shows exacting tendency for involvement of the hypothalamo–pituitary axis (HPA), leading to diabetes insipidus (DI) and/or anterior pituitary dysfunction. DI is most common endocrine involvement; incidence is approximately 50% (15). DI can predict the presence of LCH and is usually constant and does not react to some obtainable treatment (16). Most frequent anterior pituitary hormone deficiency is Growth hormone (GH) (17). The second most ordinary anterior pituitary hormone deficiency in adults with LCH is Gonadotropin deficiency. Disorder in levels Adrenocorticotropin (ACTH) is reported in 1–2% of LCH patients, Prolactin (PRL) levels differ, and fairly Elevated (18). Hypothalamus involvement in LCH show to neurological and neuropsychological disorders such as disorder of appetite, sleeping pattern, behavioral, skills, body temperature regulation and memory impairment Thyroid and pancrass involvement is uncommon. Bone lesion may be silent in some sites but in mouth are specially trouble because of tooth loose mandible lesion tend to devastate alveolar bone. Prognosis of LCH depends on age of patient extent of disease and presence of vital organ failure.

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