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Contents

Editorial

Dr Abdul Abyad
Chief Editor

This is the fourth issue this year.   The journal has reached new status and has been improving gradually with the help of all the authors , the reviewers and the production team.

In this issue a Comparative Prospective study was conducted on 100 intubated mechanically ventilated patients who were admitted in Geriatric ICU in Ain Shams. The authors objectives were to (i) diagnose VAP cases among mechanically ventilated patients, (ii) estimate the incidence rate of VAP per 1000 ventilation days, (iii) evaluate the role of colonization and ventilator bundle implementation in prevention of VAP. The total VAP rate was 59.2/1000 ventilator days. The authors concluded that implementation of VAP care bundle had reduced the VAP rate.

A paper from Libya reported a case of neurofibromatosis. Neurofibromatosis type I (NF-1) is an inherited (autosomal dominant) disease caused by mutation of the neurofibromatosis gene. The neurofibromatosis gene is located at chromosome 17q11.2. It is multi-system, neurocutaneous disorder that predisposes to the development of benign and malignant tumors. We report a case of NF-1 in a 10 year old Libyan female born to non-consanguineous parents, presented with cafe au lait spots, plexiform neurofibromas, axillary freckles, and intracranial astrocytoma.

A cross-sectional descriptive study from Egypt, attempted to assess the presence of stress in caregivers of elderly patients with systolic dysfunction and to determine its related factors. The study was performed with structured questionnaire and interviews, and conducted in outpatient and inpatient geriatric units on a sample of 150 elderly patients, diagnosed with systolic dysfunction and their 150 family caregivers. Caregiver burden and potential determinants were measured in all participant partners using Caregiver Burden Questionnaire. The authors concluded that care giving had a negative impact on the lives of family caregivers of elderly patients with heart failure, and severity of HF was an important determinant.

A second paper from Cairo looked at the relationship of Executive dysfunction & Diabetes mellitus among elderly patients at El-demerdash hospital.

A total of 120 elderly with 60 of them diagnosed as diabetics(cases), while the other 60 were not(controls); both groups were assessed by comprehensive geriatric assessment and evaluation of their executive dysfunction by different neuropsychological tests. The authors concluded that executive dysfunction is more common among the elderly, in addition, the MMSE which is commonly used to evaluate the cognitive status of the elderly is not sufficient to evaluate this dysfunction.

A retrospective chart review paper from Amman Jordan described postoperative external dacryocystorhinostomy complications at the military hospitals of Jordan.

Postoperative external dacryocystorhinostomy complications were encountered in 36(18.3%) patients out of 197 patients who had external DCR, 5(13.9%) males and 31(86.1%) females with a male to female ratio of 1:6. The authors concluded that postoperative external dacryocystorhinostomy were common, and some of these complications were underestimated before because of the spontaneous resolution. Recurrent epiphora was relatively rare and this may be due to the big osteotomy size adopted in their surgery. Other complications could be avoided by special attention to wound closure.

A paper from Bangladesh looked at the Health Status of Elderly in the area of Godagari Upazila. The data for the study was collected from 344 people having age 60+ and living in four unions (local administrative unit) of Godagari Upazilla (namely Mohonpur, Reshikul, Matikata and Basudevpur) of Rajshahi district, Bangladesh using simple random sampling technique. The results indicate that most of the elderly, both male and female, are unhealthy and suffering from two or more diseases. The most common health problems elderly people facing include Gastric, eye sight and paralysis. The health status of women is found to be poorer than men. The authors concluded that Elderly is a serious reality of our life cycle and elderly people are considered to be the asset of a nation as their experience, wisdom and knowledge can be used for the national reconstruction. So, let the policy-makers come forward to develop specific action plans for the well-being of elderly people of Bangladesh.

Caregiver Stress in Partners of Heart Failure Elderly Patients

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ABSTRACT

The aim of this study was to assess the presence of stress in caregivers of elderly patients with systolic dysfunction and to determine its related factors. The study is a cross-sectional descriptive study, performed with structured questionnaire and interviews, conducted in outpatient and inpatient geriatric unit on a sample of 150 elderly patients, diagnosed with systolic dysfunction and their 150 family caregivers. Caregiver burden and potential determinants were measured in all participant partners using Caregiver Burden Questionnaire. Diagnosis of HF was made by ECHO. The severity of HF of the elderly patients was determined according to NYHA classification. Results revealed that among the patients' variables, the severity of patients' symptoms and the functional state were significantly associated with care giver stress (p: .000, .009 respectively), and degree of stress (p: .000, .000 respectively). And among the partners' variables, female sex, marital state and depression were significantly associated with caregiver stress (p: .001, .049, .000 respectively), and with the degree of caregiver stress (P: .008, .025, .000 respectively). Also the patients' ejection fraction was significantly associated with caregiver stress and caregiver depression (p: .000, .000 respectively), while partners' age was significantly associated with caregiver depression only (p: .042). The correlation between patients' age, EF, caregivers' age and caregiver stress degree using Pearson correlation coefficient revealed a significant negative correlation between the patients' EF and the degree of caregiver stress, (r: -.650, p value: 0.000), while it revealed a significant positive correlation between caregiver age and caregiver stress degree (r: 313 p: .000).

To conclude: care giving had a negative impact on the lives of family caregivers of elderly patients with heart failure, and severity of HF was an important determinant.

Introduction

With an aging population and changes in health care, such as shorter hospital stays, more and more caregiving is being provided by people who aren't health care professionals. A caregiver is anyone who provides help to another person in need, whether that's an ill spouse or partner, a disabled child, or an aging relative. Indeed, more than 65 million Americans provide care to a loved one. [1]

Many elderly patients are forced to become dependent upon another individual in order to accomplish daily tasks that were previously handled alone. These individuals, are collectively known as informal caregivers. The complexity of caregiver responsibilities varies and is often difficult to define. The caregiver's role is often dictated by the severity of a patient's disease at time of diagnosis, the response to and complications of treatment, and a patient's projected length of survival. [2]

A substantial body of research shows that family members who provide care to individuals with chronic or disabling conditions are themselves at risk. Emotional, mental, and physical health problems arise from complex caregiving situations and the strains of caring for frail or disabled relatives. [3]

Research in populations with varying chronic conditions has shown that providing care to a chronically ill family member contributes to physical morbidity and even to mortality in caregivers. [4]

Caregiver burden is an all-encompassing term used to describe the physical, emotional and financial toll of providing care. [5]

Heart failure continues to be a major public health problem in the United States, with more than 5 million diagnoses of heart failure and nearly 500,000 new cases reported annually. [6]

Heart failure is a leading cause of hospitalization for elderly patients and costs millions of dollars in health care annually. Importantly, the health-related quality of life (HRQL) of these patients is poor because of the many troublesome signs and symptoms they experience. To improve survival, enhance HRQL, and reduce costly hospitalizations, patients with heart failure must adhere to complex medication, dietary, and self-care regimens, adherence that often requires the assistance of the patients' family caregivers. [7]

Caregivers of patients with heart failure have reported problems similar to those of caregivers of patients with other chronic illnesses, although some differences within the context of heart failure may present unique challenges. For example, the frequent periods of exacerbation leading to hospitalizations may contribute to caregivers' stressors among those who care for patients with heart failure. The need to monitor signs and symptoms to prevent decompensation may be a challenge to caregivers of heart failure patients that does not occur with other disorders. The cognitive impairments that occur in 25% to 50% of patients with heart failure may also increase caregivers' stress. [8]

The purpose of this study was to contribute additional information concerning caregiver stress of caregivers of heart failure elderly patients, which would surely affect their quality of life. This information could help to establish interventions to decrease the burden on caregivers and, consequently, to influence positively the care provided to patients.

Materials and Methods

Procedure:
This is a cross-sectional descriptive study. The study included 150 elderly patients, 60 or more years old, and their caregivers, who accompanied them either in the inpatient or the outpatient clinic.The data were collected between January and August 2010.

Potentially eligible patients and caregivers were invited to participate in the study. A verbal consent was obtained from both the patient and the caregiver to participate in the study. For their convenience, caregivers were offered the choice of completing the questionnaires face to face with an interviewer, or by telephone.

The interviewer read all questions to the caregivers during the interviews in order to standardize data collection. All data of the patients were retrieved from the patients' medical records and were entered into the database.

Sample:
A convenience sample of 150 patients and their family caregivers were enrolled in the study. Patients were eligible to participate in the study if they were diagnosed with systolic HF (EF < 40%). Patients with renal failure, liver failure, COPD, respiratory failure, stroke, delirium or dementia were excluded from the study. They were all stage C HF according to ACC/AHA staging and classified according to the New York Heart Association Staging (NYHA) from (I to IV) according to the severity of symptoms. Caregivers were eligible if they were a family caregiver, defined in this study as a family member or friend of the patient who helps the patient at home with self-care activities and is not paid to do so, were able to speak Arabic and hear at a conversational tone, were alert and oriented as determined by the interviewer, and had access to a working telephone.

Data Collection:
Done during baseline interviews with the patient and the caregiver.
1 - Elderly patients:
• Comprehensive Geriatric Assessment.
• The severity of heart failure was measured by using the New York Heart Association classifications. [9]
• ECHO medical reports for the left ventricular ejection fraction.
2 - Caregivers:
They were asked to fill in the Zarit Burden Interview (ZBI) questionnaire [10].

Numerous questionnaires have been developed to quantify the largely subjective domain of caregiver burden, but the ZBI is the most widely referenced scale in studies of caregiver burden.

Zarit Burden Interview: [11]
• **Variations/Translations:** Originally a 29-item scale, the 22 item version is more commonly used. Shorter versions of the ZBI have been developed with 18 and 12 items. Translations of the ZBI are available in French, Japanese, Chinese, Korean, Spanish and Brazilian. The test is known under two different names, the ZBI and the Burden Interview (BI).

• **Setting:** Can be used in either a clinical or a community setting.

• **Method of Delivery:** Self-report questionnaire.• Description: The ZBI was developed to measure subjective burden among caregivers of adults with dementia. Items were generated based on clinical experience with caregivers and prior studies resulting in a 22-item self-report inventory that examines burden associated with functional/behavioural impairments and the home care situation. The items are worded subjectively, focusing on the affective response of the caregiver.

• **Scoring/Interpretation:** Each question is scored on a 5 point Likert scale ranging from: - {never to nearly always present}. Total scores range from 0 (low burden) to 88 (high burden). Score values and interpretation are guidelines only.

• Quantitative/Qualitative: Quantitative.

• **Validity (Quantitative):** Good construct validity. The items possess content validity as they were derived from clinical and research experience with caregivers of individuals with dementia and reflect common areas of concern, namely, health, finances, social life, and interpersonal relations. Spearman's rho correlations include: .32 with activities of daily living, .32 with social life restrictions, .41 with the Brief Symptoms Inventory, .71 with the global index of burden, and -.57 with the quality of relationship between the caregiver and the recipient.

• **Reliability (Quantitative):** Excellent internal consistency; Cronbach's alpha = 0.83 and 0.89. A test-retest reliability of 0.71 was obtained.

• **Linguistic validation of the Arabic ZBI:**
Translation to Arabic and confirmation of the linguistic validity and reliability of the Arabic version was made for the current study. The translation of the ZBI was done according to international methodological recommendations for the linguistic and cultural adaptation of questionnaires [12] using the English version as the source. Six steps of the translation process were followed: forward translation by 2 translators, meeting with the coordinator of the translation, a check by a bilingual expert to evaluate the scientific correctness of the wording, a backwards translation, meeting among the translators with the coordinator, and finally a pretest with a chosen sample. The translated questionnaire was tested on 15 volunteers who were allowed to comment on their understanding on each question. A few statements were changed in the Arabic translation to reflect the same correct meaning in the English version. The stability of the Arabic ZBI questionnaire was examined by the test-retest method and the Pearson correlation coefficient between the 2 measures, done on the same group of 15 participants 1 week apart, revealed 90% test-retest agreement.

Statistical Analyses:
All data were entered into the 16th version of SPSS (Statistical Package of Social Science) and analyzed using frequency and descriptive statistics to analyze the study population. Frequency and percentage was calculated for all qualitative variables. Description of all data in the form of mean (M) and standard deviation (SD) was done for all quantitative variables. Comparison of qualitative variables was done using Chi-square test; it is a test that determines the extent that a single observed series of proportions differs from a theoretical or expected distribution of proportions, or the extent that two or more series of proportions or frequencies differ from one another based on the chi-square distribution.

Comparison between quantitative variables was done using t-test to compare two groups, and ANOVA (analysis of variance) to compare more than two groups. Pearson's correlation coefficient, which is a measure of linear association, was done to find linear relation between the dependent variable, which is the caregiver stress burden, and different independent variables which are the patients' age, the EF% and the caregivers' age using r-test or Spearman correlation co-efficient.

The level of significance for Chi-square test, t-test and ANOVA was taken at P value < 0.05 is significant, otherwise is non significant. For Spearman correlation co-efficient; correlation is significant at the 0.01 level (2-tailed).

Results
The study was conducted on 150 elderly patients and their caregivers. Table 1 (next page) shows the demographic and the clinical characteristics of the participants: The mean age of the caregivers was 41.5 ± 12.01 (range: 18 - 67). Most of the caregivers were females: (female no = 108, 72%, while male no = 42, 38%) and they were not working. 92 (61.3 %) of the caregivers were married, 9 (6 %) were widows, 22 (14.7 %) were divorced or having marital problems, and 27 (18 %) were single. 55 (36.7 %) of the caregivers cannot read or write, 70 (46.7 %) can read and write and 25 (16.7%) finished primary school. 64 (42.7%) of the care givers were depressed and 86 (57.3%) were not depressed. 125 (83.3%) of the caregivers had caregiver stress, and 25 (16.7%) did not. Regarding the degree of stress; 14 (9.3%) of the stressed caregivers had severe stress, 33 (22%) had moderate stress, 46 (30.7%) had mild stress, 32 (21.3%) had minimal stress. Regarding the sample of the elderly patients; the mean age of the patients was 67.6 ± 6.2 (range: 60 - 80), 76 (50.7%) were males and 74 (49.3%) were females. 94 (62%) were married, 51 (34%) were widowed and 5 (3.3%) were divorced. 40 (26.7%) were still working, 47 (31.3%) were retired and receiving pension and 63 (42%) were not working with no pension. 22 (14.7%) were NYHA I, 67 (50.7%) were NYHA II, 36 (24%) were NYHA III, 16 (10.7%) were NYHA IV, 31 (20.7%) were functionally independent, 79 (52.7%) were assisted, and 40 (26.7%) were dependent.

Demographic variables	Frequency		Total	
Patients' sex				
Males	76	50.7%	150	100%
Females	74	49.3%		
Patients' marital status				
Married	94	62.7%	150	100%
Widow	52	34%		
Divorced	5	3.3%		
Patients' work				
Working	40	26.7%	150	100%
Pensioned	47	31.3%		
No work, no pension	63	42%		
Patients' NYHA				
I	22	14.7%		
II	76	50.7%	150	100%
III	36	24%		
IV	16	10.7%		
Patients' functional state by (ADL, IADL):				
Independent	31	20.7%		
Assisted	79	52.7%	150	100%
Dependent	40	26.7%		
Caregiver sex				
Males	42	28%	150	100%
females	108	72%		
Caregivers' education				
Cannot read or write	55	36.7%		
Can read and write	70	46.7%	150	100%
1ry school	25	16.7%		
Caregivers' marital status				
Married	92	61.3%		
Widow	9	6%	150	100%
Divorced	22	14.7%		
Single	27	18%		
Caregiver depression				
Depressed	64	42.7%	150	100%
Not depressed	86	57.3%		
Caregiver stress				
Present	125	83.3%	150	100%
Not present	25	16.7%		
Caregiver stress degree				
No	25	16.7%		
Minimal	32	21.3%	150	100%
Mild	46	30.7%		
Moderate	33	22%		
Severe	14	9.3%		

	Caregiver stress		Caregiver degree of stress	
Patients variables	X	P value	X	P value
Patients' sex	.021	.884		
Patients' marital st.	1.17	.557		
Patients' work	.737	.692		
NYHA	24.04	.000	80.5	.000
Functional state	9.3	.009	71.6	.000
Partners' variables	X	P value		
Caregivers' sex	11.6	.001	13.8	.008
Caregivers' marital st.	7.87	.049	23.38	.025
Caregivers' education	5.61	.060		
Caregivers' depression	22.3	.000	81.2	.000

Table 2: Chi square for the association of patients' and caregivers' variables with caregiver stress and caregiver degree of stress

Table 2 displayed the association of patients' and caregivers' variables with caregiver stress and degree of stress and revealed that among the patients' variables, the severity of patients' symptoms; determined by NYHA, and the functional state; determined by ADL and IADL, were significantly associated with care giver stress (p: .000, .009 respectively), and degree of stress (p: .000, .000 respectively). And among the partners' variables, female sex, marital state and depression were significantly associated with care giver stress (p: .001, .049, .000 respectively), and with degree of caregiver stress (P: .008, .025, .000 respectively).

Table 3 (next page) displays the Comparison between the mean values of patients' and partners' variables as regards caregiver stress and depression using independent t test; it revealed that the patients' ejection fraction was significantly associated with caregiver stress and caregiver depression (p: .000,.000 respectively), while partners' age was significantly associated with caregiver depression only (p: .042).

Table 4 displays the comparison between mean values of patients' and partners' variables as regards the functional state of the patients; assessed by ADL and IADL using ANOVA test, and it revealed that patients' age , ejection fraction, and caregiver stress were both significantly associated with patients; functional state, (p: .000).

Table 5 displays the correlation between patients' age, EF, caregivers' age and caregiver stress using Pearson correlation coefficient and revealed a significant negative correlation between the patients' EF and the degree of caregiver stress, (r: -.650, p value: 0.000), while a significant positive correlation between caregiver age and caregiver stress degree (r: 313 p:.000).

Discussion

Despite the increasing incidence and prevalence of CHF [13] and the potentially high care giving demands, particularly in moderate to severe CHF, there are few comprehensive studies that have systematically examined the physical and psychological impact of CHF on informal caregivers or that have examined the role of informal caregivers in managing the disease.

Studies revealed that caregivers of chronically ill patients have reported stress, burden, depression, anxiety, and poor physical and emotional health. [14]

Caregivers of patients with heart failure have reported problems similar to those of caregivers of patients with other chronic illnesses, although some differences within the context of heart failure may present unique challenges. For example, the frequent periods of exacerbation leading to hospitalizations may contribute to caregivers' stressors among those who care for patients with heart failure. The need to monitor signs and symptoms to prevent decompensation may be a challenge to caregivers of heart failure patients that does not occur with other disorders. [15]

The present study is one of the first studies that investigated the feelings and burden of caregiver in partners of HF elderly

	Caregiver stress			t	P value
	Absent		Present		
Patient's variables **Mean and SD**	Mean SD		Mean SD		
Age	66.9 6.02		67.7 6.31	.577	.565
Ejection fraction	32.8 2.96		28.9 5.22	3.66	.000
Partners' variables					
Age	37.7 13.2		42.3 11.6	1.77	.078
	Caregiver depression			t	P value
	Absent		Present		
Patient's variables **Mean and SD**	Mean SD		Mean SD		
Age	66.9 5.9		68.4 6.6	1.4	.145
Ejection fraction	31.6 4.1		26.8 5.0	6.3	.000
Partners' variables					
Age	39.8 11.6		43.8 12.1	2.04	.042
Caregiver stress	15.4 13.6		47.2 16.2	12.9	.000

Table 3: Comparison between the mean values of patients' and partners' variables as regards caregiver stress and caregiver depression using independent t test

patients. We tried to elucidate which factors were associated with severe degree of caregiver stress and to define the impact of patient's disease severity.

The present analysis revealed that the prevalence of caregiver stress in a sample of 150 caregivers of elderly patients with HF was 83.3%, and the patients' disease severity was an important issue related to caregiver burden, revealing the potentially high demands that family members may face, particularly in the advanced stages of the condition.

This is comparable to Pihl et al., 2005 [16] who reported that clinicians in general were primarily involved with treating the patient, and that the patient's environment was often considered from the patient's perspective, and stated that

from that point of view it seemed logical to assume that more severe HF would indicate higher levels of impairment, placing more demands on the caregiver which would cause increased caregiver burden.

However, from research in other chronically ill populations, Molloy et al., 2005 reported that disease severity was only partly associated with caregiver burden, and that within the field of HF, conflicting results on the relationship between severity of HF and caregiver burden had been reported. [17]

In studying determinants of caregiver burden, other variables have to be considered as well. Demographic factors such as gender, age, and marital status are known to be related to caregiver burden. [18]

	Functional state						f	P value
	Independent		Assisted		Dependent			
Patient's variables Mean and SD	Mean	SD	Mean	SD	Mean	SD		
Age	63.36	3.6	67.2	6.2	71.7	5.3	20.07	.000
Ejection fraction	33.6	3.5	30.6	4.0	24.2	3.7	58.5	.000
Partners' variables								
Caregiver stress	13.4	12.2	25.5	18.0	48.0	20.8	30.03	.000

Table 4: Comparison between mean values of patients' and partners' variables as regards the functional state of the patients

	r	P value
Patients' age	.115	.160
Patients' EF	-.650	.000
Caregivers' age	.313	.000

Table 5: the correlation between patients' age, EF, caregivers' age and caregiver stress using Pearson correlation coefficient

The present study showed that the caregivers' sex, marital and emotional state, and also functional status of the patients, were important issues to consider as these variables showed significant association with the caregiver stress.

While the present study did not reveal any significant association between the age and sex of the HF patients and the caregiver stress, it is obvious in our community that the caregivers of persons with chronic diseases are their relatives. Most of the time the caregiver is a woman, usually the wife or daughter, from different social groups, who has been providing care for periods ranging from months to decades and, generally, lives with the patient.

This was reflected in the present study as most of the caregivers were female (n = 108 [72%]), ranging in age from: 22 to 67 and uniformly she was a daughter or a wife.

Besides, the study revealed that caregiver stress and degree of stress were significantly more present in female than male caregivers; (mean value of ZBI questionnaire in females: 32.9, SD: 21.3 while in males: 19.04, SD: 19.04, t: 3.6, p: .000)

This can be explained as female caregivers could have more difficulty in performing helping behaviors to HF patients as the fact that partners have to perform care giving tasks is surely related to feelings of burden, especially when it concerns tasks regarding personal care such as assisting with washing and bathing and moving in and around the house.

And this is supported by Marie et al., 2007 [19] who investigated caregiver burden in order to identify caregivers who were at risk. They conducted a cross-sectional study to determine caregiver burden in partners of HF patients; partners had completed questionnaires on caregiver burden (the Caregiver Reaction Assessment, CRA). They found that gender differences were present in caregiver burden with women reporting higher scores on the caregiver burden domain. Their findings were consistent with earlier studies revealing that women report a higher need for social support than men.

The other two demographic predictors of caregiver outcomes are the age and marital status of caregiver.

Some studies revealed that being younger was associated with poorer mental health and greater care giving strain outcomes for caregivers. [20]

While Rohrbaugh et al., 2002 [21] reported that in studies of CHF caregivers, the age of caregiver was not related to indices of caregiver strain or burden.

The finding of the present study did not agree with the former study findings, as our results revealed a significant positive correlation between caregivers' age and caregivers' stress (r: .313, p: .000); this can be explained by that increasing caregiver age means increased responsibilities e.g. as the majority of caregivers were females; being older meaning to have more children and might have health troubles that added to the care giving strain more than young caregivers.

And this can be supported by Ann Burack-Weissi, 2007 [22] who defined caregivers as people who provided unpaid care by looking after an ill, frail or disabled family member, friend or partner, and she reported that adults who acted as caregivers for both their children and their parents were frequently called the Sandwich generation,and she defined the sandwich generation as the generation of people who cared for their aging parents while supporting their own children.

Also the current study revealed significant association between caregivers' age and caregiver depression (p: .042) and this finding supported the concept that increasing age of caregivers was associated with increasing caregiver stress and consequently depression among them.

Taking into consideration the study finding of significant presence of depression among caregivers of HF patients and significant association between depression and caregiver burden (p: .000), would support the close relationship between the age of partners who care for HF elderly patients and the burden they bore and consequently the depression and emotional stress they suffered.

Many studies supported the presence of depression in caregivers of chronically ill elderly patients. One of these studies conducted by Pinquart and Sorensen, 2003 [23] who stated that measures of emotional distress such as depression and anxiety were important outcomes in the wider caregiver literature and most studies had shown that informal caregiver was associated with increased levels of emotional distress.

Also, Farran et al., 2004 [24] reported that most of the care provided to patients with major chronic illnesses such as heart failure, was performed by family caregivers. They estimated that 90% of care of patients with chronic illness in the United States had been delivered by family caregivers. They stated that in the landmark Caregiver Health Effects Study, caregivers who had reported having emotional strain as a result of caregiving were 63% more likely to die compared with the noncaregivers.

Other studies supported the effect of caregiver stress and the resultant depression on the HF patients and revealed that the interaction of caregiver stress and depression was associated with increased risk of CHF patient readmission, and that caregivers who had high levels of stress and depression might be less able to fulfill their caregiver role, which could have potentially increased the chance of patient readmission. [25]

By reviewing studies, there is controversy regarding the marital status impact on caregiver burden. Our study revealed a significant association between marital status of the part-

ners and caregiver stress and degree of stress (p: .049, .025 respectively: 22 divorced caregivers or with marital problems had stress versus 0 with no stress) and this is consistent with many studies, e.g.: Marie et al., 2007, [19] who conducted a cross-sectional study to determine caregiver burden in partners of HF patients, using the Caregiver Reaction Assessment questionnaire (CRA), found that low perception or poor quality of the marital relationship of partners revealed significantly higher caregiver burden scores, while other studies e.g: Rohrbaugh et al., 2002 [27] did not report significant impact of marital status on the caregiver burden. Possible explanation may be in the way quality of the marital relationship was measured, as a single-item score, and the lack of variance in this score. This might be also related to the way that marital quality was assessed. Patients and partners were instructed to complete the questionnaire independently from each other, but since questionnaires were completed at home without the researcher being present, there is no guarantee that these instructions were followed precisely.

The current study demonstrated that higher NYHA class of the patients was significantly associated with increased caregiver burden and the degree of stress, (p: .000, .000) and also a significant negative correlation between the EF and the caregiver stress. These results are supported by Barnes et al., 2006 [27] who concluded that higher patient NYHA class, and consequently the amount of care tasks performed, were associated with a more negative impact of care giving in their study, and that that information could be useful for clinicians who work with heart failure patients and the patients' families to reconsider extra attention for family caregivers who received no assistance with care giving.

Also Boyoung et al., 2011 [28] identified factors associated with the impact of care giving in heart failure patients. The study revealed that factors associated with disruption of caregivers' usual activities included the patient's NYHA class, amount of care giving tasks performed, and caregivers' perceived social support.

The current study revealed that functional impairment of the HF patients, which was assessed by ADL and IADL, was significantly related to the caregivers stress and severity of caregiver burden (p: .009, .000 respectively) and also significant association between the functional status and EF of the patients (p: .000). The same finding was supported by DeGeest et al., 2003 [29] who stated that due to the considerable levels of disability in general ambulation and managing the household that could be attributed to CHF, individuals with moderate to severe CHF were often reliant on family or friends for assistance with instrumental activities of daily living (IADLs, e.g., shopping, housekeeping) and sometimes even activities of daily living (ADLs, e.g., bathing or dressing). They stated that family members caring for an individual with CHF might also have to endure and attend to a range of problems and that the combination of these factors had the potential to severely impact upon individuals providing informal care for CHF patients.

Conclusion

Care giving has a negative impact on the lives of family caregivers of elderly patients with heart failure. However, at the same time, many family caregivers feel positive about their role as a caregiver. Our findings displayed the drawbacks and the stressful determinants of care giving and thus reinforced the importance of assessing the needs of family members who provide care for patients with heart failure. The assessment should be initiated during the patient's hospitalization to minimize the negative impact of care giving on caregivers' health. In addition, clinicians should provide extra support for family caregivers during the period after hospitalization. Interventions for family caregivers should be aimed at increasing the caregivers' sense of control and social support. Moreover, providing social support may increase positive feelings among family caregivers about providing care. So supporting family caregivers for HF elderly patients is a national health priority.

References

1. Collins LG, et al. Caregiver care. American Family Physician. 2011;83:1309.

2. Honea NJ, Britnall R, Sherwood P, et al. Putting evidence into practice: nursing assessment and interventions to reduce family caregiver burden and strain. J Clin Oncol. 2007;12(3):507-516.

3. Family Caregiver Alliance (2006). Caregiver Assessment: Principles, Guidelines and Strategies for Change. Report from a National Consensus Development Coference (Vol. I).

4. Vitaliano PP, Zhang J, Scanlan JM. Is caregiving hazardous to one's physical health? A meta-analysis. Psychol Bull 2003;129:946-72.

5. George LK, Gwyther LP. Caregiver well-being: a multidimensional examination of family caregivers of demented adults. Gerontologist. 1986;26:253-9.

6. American Heart Association. Heart and Stroke Statistics-2007 Update. Dallas, TX: American Heart Association; 2007.

7. Heart Failure Society of America. HFSA 2006 Comprehensive Heart Failure Practice Guideline. J Card Fail. 2006; 12(1): e1-e119.

8. Bennett SJ, Sauve MJ. Cognitive deficits in patients with heart failure: a review of the literature. J Cardiovasc Nurs. 2003; 18: 219-242.

9. New York Heart Association Criteria Committee. Diseases of the Heart and Blood Vessels: Nomenclature and Criteria for Diagnosis. 6th ed. Boston, MA: Little Brown & Co; 1964.

10. Zarit SH, Reever KE, Bach-Peterson J. Relatives of the impaired elderly: correlates of feelings of burden. Gerontologist. 1980;20:649-55.

11. Bédard, M., Molloy, W., Squire, L., Dubois, S., Lever, J.A., & O'Donnell, M. (2001). The Zarit Burden Interview: A New Short Version and Screening Version. Gerontologist, 41: 652-657

12. Acquadro C et al. Languages and translation issues in quality of life and pharmaco-econonomics. Clinical Trials, 1996, 2:575-585.

13. McMurray J.J. and Stewart S. Epidemiology, aetiology, and prognosis of heart failure. Heart 2000; 83:596-602.

14. Farran CJ, Loukissa D, Perraud S, Paun O. Alzheimer's disease caregiving information and skills, II: family caregiver issues and concerns. Res Nurs Health. 2004; 27: 40-51.

15. Bakas T, Pressler SJ, Johnson EA, Nauser JA, Shaneyfelt T. Family caregiving in heart failure. Nurs Res. 2006; 55(3): 180-188.

16. Pihl E, Jacobsson A, Fridlund B, Stromberg A, Martensson J. Depression and health-related quality of life in elderly patients suffering from heart failure and their spouses: a comparative study. Eur J Heart Fail 2005; 7:583-9.

17. Molloy GJ, Johnston DW, Witham MD. Family caregiving and congestive heart failure. Review and analysis. Eur J Heart Fail 2005;7: 592-603

18. Pihl E, Jacobsson A, Fridlund B, Stromberg A, Martensson J. Depression and health-related quality of life in elderly patients suffering from heart failure and their spouses: a comparative study. Eur J Heart Fail 2005;7:583-9.

19. Marie Louise Luttik, Tiny Jaarsma, Nic Veeger, Jan Tijssen, Robbert Sanderman, Dirk J. van Veldhuisen. Caregiver burden in partners of Heart Failure patients; limited influence of disease severity, European Journal of Heart Failure 2007; 9: 695-701

20. Yee J.L., Schulz R. Gender differences in psychiatric morbidity among family caregivers: a review and analysis. Gerontologist 2000; 40:147-164.

21. Rohrbaugh M.J., Cranford J.A., Shoham V., Nicklas J.M., Sonnega J.S., Coyne J.C. Couples coping with congestive heart failure: role and gender differences in psychological distress. J. Fam. Psychol. 2002;16:3-13.

22. Ann Burack-Weissi, "The Caregiver's Tale: Loss and Renewal in Memoirs of Family Life", Journal of Marriage and Family, 2007; 69, no. 1: 271-272

23. Pinquart M., Sorensen S. Differences between caregivers and noncaregivers in psychological health and physical health: a meta-analysis. Psychol. Aging 2003;18:250-267.

24. Farran CJ, Loukissa D, Perraud S, Paun O. Alzheimer's disease caregiving information and skills, II: family caregiver issues and concerns. Res Nurs Health. 2004; 27: 40-51.

25. Martensson J., Dracup K., Canary C., Fridlund B. Living with heart failure: depression and quality of life in patients and spouses. J. Heart Lung Transplant. 2003; 22:460-467.

26. Rohrbaugh MJ, Cranford JA, Shoham V, Nicklas JM, Sonnega JS, Coyne JC. Couples coping with congestive heart failure: role and gender differences in psychological distress. J Fam Psychol 2002;16: 3-13.

27. Barnes S, Gott M, Payne S, et al. Characteristics and views of family carers of older people with heart failure. Int J Palliat Nurs. 2006; 12(8):380-389.

28. Boyoung Hwang, RN, PhD, Kirsten E. Fleischmann, MD, MPH, Jill Howie-Esquivel, RN, PhD, Nancy A. Stotts, RN, EdD, and Kathleen Dracup, RN, DNSc, FNP. Care giving for patients with heart failure: Impact on patients' families. American Journal of Critical Care, 2011; 20 (6): 431 - 441.

29. DeGeest A., Scheurweghs L., Reynders I., Pelemans W., Droogné W., Van Cleemput J., et al. Differences in psychosocial and behavioral profiles between heart failure patients admitted to cardiology and geriatric wards. Eur. J. Heart Fail. 2003; 5:557-567.

Original Contribution/Clinical Investigation

Executive dysfunction and Diabetes mellitus among elderly patients at El-demerdash hospital

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ABSTRACT

Background : Although DSM-IV (American Psychiatric Association, 2000) recognizes impairment of executive function as a diagnostic criterion only for dementia, poor executive function is found in many other psychiatric disorders, including schizophrenia, substance use disorders, and depression. Furthermore, executive impairment is associated with many common medical disorders, including ischemic and hemorrhagic stroke, chronic obstructive pulmonary disease, hypertension, and diabetes. (Stratta P. et al., 2001).

Aim: of the current study was to compare between diabetics and non diabetics regarding their executive function.

Methodology : 120 elderly with 60 of them diagnosed as diabetics (cases), while the other 60 are not (controls); both groups were assessed by comprehensive geriatric assessment and evaluation of their executive dysfunction by different neuropsychological tests.

Setting: patients were recruited from the in-patient ward, Geriatric ICU and the outpatient clinic of the Geriatric department, Ain-Shams University Hospital

Results: controls performed better when applying MMSE but the difference was not statistically significant and when applying other tests specially designed for executive dysfunction the control group also performed better with statistically significant differences.

Conclusion & Recommendation: executive dysfunction is more common among the elderly, in addition, the MMSE which is commonly used to evaluate the cognitive status of the elderly is not enough to evaluate this dysfunction.

Introduction

It is well established that impairments in cognitive functioning are often seen with advancing age but age does not seem to affect all areas of cognition and all older adults in the same way (Asimako Poulou et al., 2002). Older people with type II diabetes mellitus are more likely to have some cognitive impairment compared to people without the illness, however, such impairment is probably limited to relatively complex cognitive processes (such as verbal memory and psychomotor efficiency) (Koula Asimako Poulou, 2002). It was concluded that with increasing age, people with diabetes are more likely to be prone to diabetes - associated memory and learning difficulties than to declines in other areas of cognitive functioning; they are also likely to have some slowing of psychomotor functioning. Both cross-sectional and prospective studies have reported a positive association between diabetes duration and extent of cognitive dysfunction (Grodstein, 2001). The prevalence of DM is growing rapidly in both developing and developed countries and the worldwide estimates of its prevalence are expected to rise from 2.8% (171 million people) in 2000 to 4.4% (366 million people) in 2030 (Wild et al., 2004). As defined by DSM-IV, "executive function" is one's ability to think abstractly and to plan, initiate, sequence, monitor, and stop complex behavior (Schellerstrom et al., 2005). A growing body of literature also suggests that executive impairment is common in patients with medical illness and non-psychiatric clinicians are largely unaware of the relevance of executive impairment in medical conditions (Schillerstrom et al., 2005). Executive function is intimately associated with a person's ability to make decisions ND their capacity to carry out a plan to live alone. also executive function affectS the patient's medical decision-making capacity due to the ability to give informed consent associated with the ability to communicate; understand the risks, benefits, and alternatives for a given procedure; and provide a logical reason for their decision in the context of the treatment situation (Cooney et al., 2004). Patients with diabetes mellitus show impairment on ECF (executive control function) measures; these measures include verbal fluency, The executive clock drawing task (CLOX1), and the executive interview (EXIT25) (Royall et al., 1999 and Reaven et al., 1990). Chronic hyperglycemia could cause cognitive impairment either by direct neuronal damage, possibly by advanced glycated end products or by indirect neuronal damage from cerebral micro-vascular atherosclerotic disease (Yaffe et al., 2004). The development of diabetic complications such as renal disease, stroke, ischemic heart disease, and hyperlipidemia is another mechanism whereby diabetes can lead to impaired cognitive performance (Yaffe et al., 2004).

Patients and Method

Study Design: A case control study

Subjects:

120 elderly patients were recruited from the in-patient ward, Geriatric ICU and the out patient clinic of the Geriatric department, Ain-Shams University Hospital, and they were divided into two groups: cases and controls.

Cases: 60 elderly subjects with Type II diabetes mellitus without Comorbid Conditions affecting the cognitive function. Control: 60 elderly subjects without diabetes mellitus and without Comorbid Conditions affecting the cognitive function as controls. (Cases and control were matched according to age and gender).

The following exclusion criteria were considered for both groups:
- Depression
- Cerebrovascular stroke.
- Previously diagnosed Dementia.
- Delirium.
- Hypertension

Methods:

All patients were subjected to
- *Comprehensive geriatric assessment:* including detailed history
- *Examination:* physical examination, mental status examination by the Arabic version (El Okl, 2002) of Mini-Mental Status Examination (MMSE) (Folstein et al.,1975), assessment of depression by the Arabic version (Shehata,1998) of the geriatric depression scale (GDS) 15 items (Sheikh and Yasavage ,1986) and functional assessment performed by ADL (Activities of Daily Living) (Katz et al.,1963) and Instrumental activities of daily living (Lawton and Brady ,1969) were performed. Then an extensive battery of tests was administered which assessed different levels and domains of cognitive and executive function including:
- *Mini Mental state examination test*
- *Executive function tests including:*

1. Block design test (Wechsler1981), Arabic version by (Melika, 1991).
2. Digit span (forward & backward) test (Wechsler1981), Arabic version by (Melika, 1991).
3. Verbal fluency test (Gladsjo et al., 1999).
4. Clock drawing test (Watson et al., 1993)
5. Exit 25 test
6. Contrast program test (Luria, 1966).

And Investigations: fasting blood sugar - 2 hour post prandial test - ECG - serum creatinine.

Statistical Analysis: Analysis of data was performed by using the 13th version of Statistical Package for Social Science (SPSS). Description of all data in the form of mean (M) and standard deviation (SD) for all quantitative variables. Frequency and percentage for all qualitative variables. Comparison between quantitative variables was done using t-test to compare two groups and ANOVA (analysis of variance) to compare more than two groups. Post Hoc test was done to detect the least significant difference. Comparison of qualitative variables was done using the Chi-square test. Correlation coefficient also was done to find linear relation between different variables using r-test or Spearman correlation co-efficient. Significant level measured according to P value (probability), $P > 0.05$ insignificant, $P < 0.05$ significant and $p < 0.01$ highly significant.

ETHICS: This study had the approval of the ethics committee of the Ain Shams Faculty of medicine. All subjects consented (orally or written) to participation in the study

Results

Studying the age in both groups revealed that the mean age among the cases was 65.16±6.04 years, while among the control group it was 67.5±6.89 years, with no statistically significant difference (P value > 0.05).

Studying gender distribution among cases, males represented 56.67% and females represented 43.33% of the cases group while among the control group males represented 65% of the group and females represented 35%, with no statistically significant difference between both groups (P value > 0.05).

Forty-two (42) subjects among the control group could read and write, in comparison to 39 subjects among the cases. 14 subjects among the control group received below high school education in comparison to 12 subjects among cases. One subject among the control group had high school education in comparison to 2 subjects among cases. Finally, 3 subjects among the control group had above high school education in comparison to 7 subjects among the cases.

There is no statistically significant difference between the patients and controls regarding educational level (P value > 0.05).

Forty (40%) of the control group were non smokers in comparison to 56.67% of the cases. 21.67% of the control group and 20% of the cases were smokers. Ex-smokers represented 38.33% of the control group and 23.33% of the cases.

There is no statistically significant difference between the studied groups regarding smoking (P value > 0.05).

Lab. Investigation showed that :
S.CR was elevated in 3% of controls and 6% of patients, with no statistically significant difference. (P value > 0.05).

By measuring FBS. among the cases, 30% were controlled (FBS <126gm/dl), while 70% were not controlled (FBS> 126gm/dl), with highly statistically significant differences. (P value <0.001)

And by measuring 2 hour pp. 28.33% of cases' 2 hour pp levels were normal (2 hour pp <200gm/dl), while 71.67% of cases' 2 hour pp. were elevated with 2 hour pp >200gm/dl, with a highly statistical significance (P value <0. 001).

By assessing the daily activity, all control groups were independent in ADL while among the cases, 91.67% are independent and 8.33% were assisted in ADL .

This is a statistically significant difference (P value =0. 022).

Also there is a statistically significant difference between the studied groups regarding IADL (P value =0. 022), where all controls were found to be independent in IADL and 91.67% of cases were found to be independent and 8.33% were found to be assisted in IADL.

• **In MMSE score:** There is a difference between cases with (mean value 28.8) and controls with (mean value 29.1) but this slight difference was not statistically significant (P value = 0.152).

Only 7.27% of control subjects were impaired while 36.36% of patients are impaired. This difference is highly statistically significant difference (P value < 0.001).

The duration of diabetes mellitus is inversely correlated with the performance in (MMSE, Block design, Exit 25, contrast program, digit span and verbal fluency tests) but directly correlated with the performance in clock drawing test with no statistically significant difference in all test s except block design test which shows a statistically significant difference (P value = 0.010).

Age is inversely correlated to the performance in MMSE test, Clock drawing test, Exit25 test and contrast program test. But it is directly correlated to the performance in block design test, verbal fluency test and digit span test, with no statistically significant difference in the performance of all these tests (P> 0.05).

Regarding gender there was no statistically significant difference in the performance of all tests (P value > 0.05).

Regarding education, there was no significant difference in MMSE & digit span scores. Block design score was high with higher level of education and this was highly statistically significant (P-value =0.009). Verbal fluency scores increased with higher levels of education and this was statistically significant (P-value =0.035).

Performance in digit span and contrast programming were better with higher levels of education but no statistically significant difference (P-value =0.137). In contrast score of EXIT25 was lower with a higher level of education and this was highly statistically significant (P-value =0.005). In clock drawing score: there is a highly statistically significant difference between the levels of education and the performance in clock drawing. (P-value =0.005)

• **In Exit 25 score :** there is a highly statistically significant difference between the levels of education and the performance in Exit 25 (P-value =0.005).

Discussion

In the current study advanced age was associated with decreased performance in all cognitive tests used in the study but this was not statistically significant. This agreed with Cosway et al. (2001) who found no evidence of cognitive impairment in a relatively younger group of people with diabetes, on the other hand older people with diabetes (over 65 years of age) were generally found to be impaired in learning and verbal memory as well as in psychomotor functioning.

There was no statistically significant gender difference regarding the executive function tests used in the current study.

This is in contrast to Grodstein et al. (2001) who found that women with type 2 diabetes had lower scores on several aspects of cognitive function by using verbal fluency test; the same result was found by Logroscino et al. (2004) who conducted his study applying both verbal fluency test and digit span backward test on 18,999 women aged 70-81 years. While
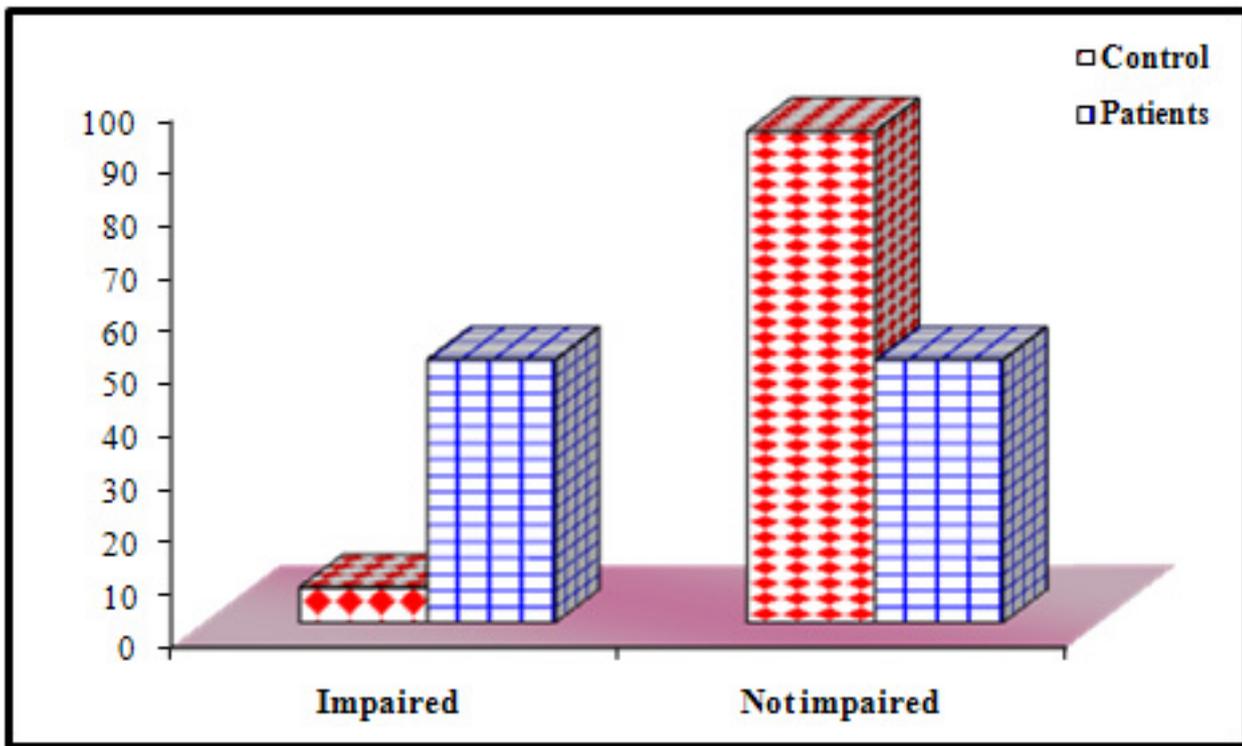
Figure 1: Comparison between the studied groups regarding the Block Design Test score

By using Block Design Test, 6% of control subjects are impaired, while 50% of patients are impaired with a highly significant difference between the studied groups (P value <0.001).
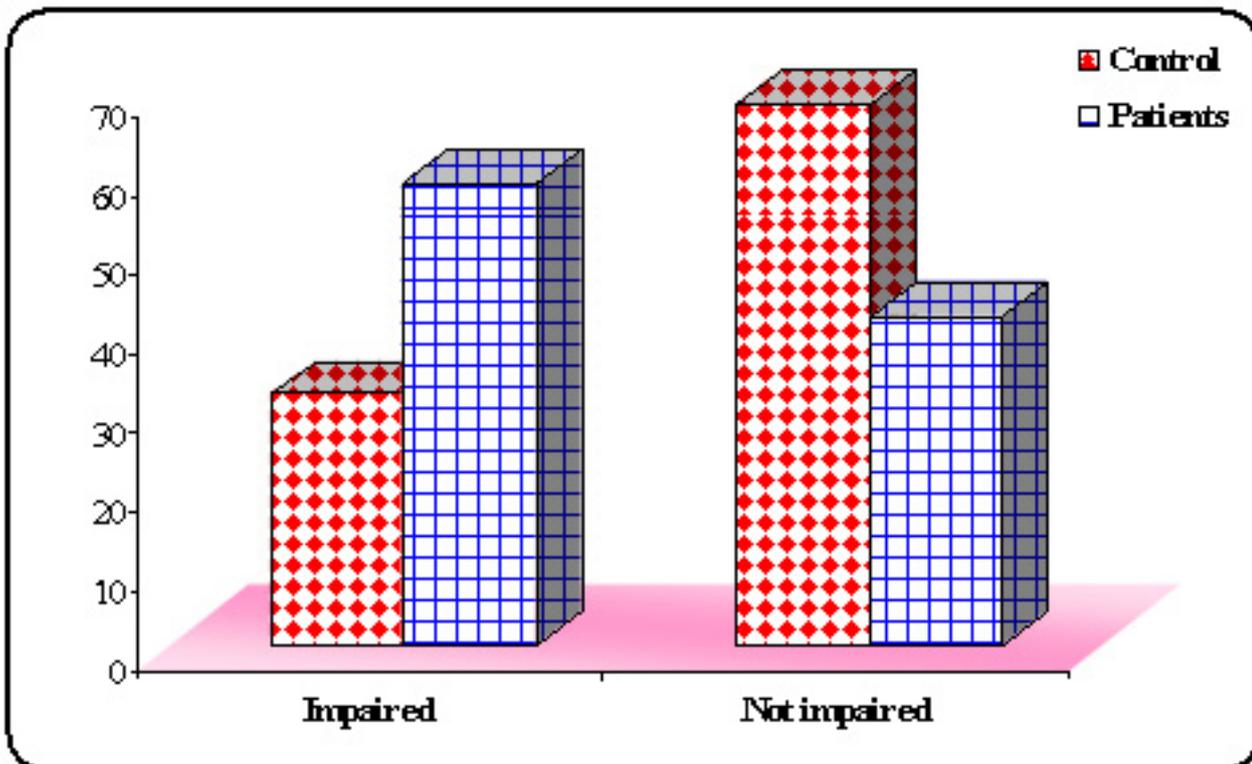
Figure 2: Comparison between the studied groups regarding the score of Digit Span Test

31% of control subjects compared to 45% of patients have impaired Digit Span Test scores. And this difference is statistically significant (P value = 0.003).
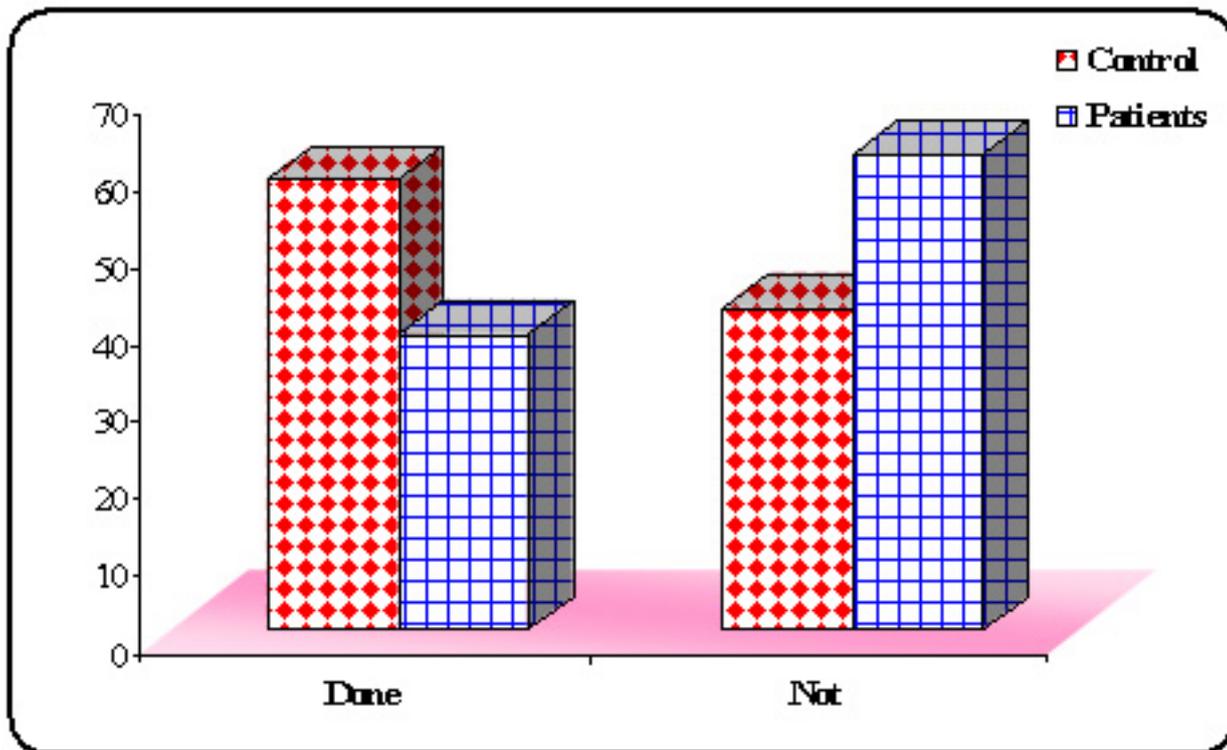
Figure 3: Comparison between the studied groups regarding the Clock Drawing Test score

Clock Drawing Test was done by 85.33% of control subjects in comparison to only 38.33% of cases. This is a statistically significant difference (P value = 0.028).
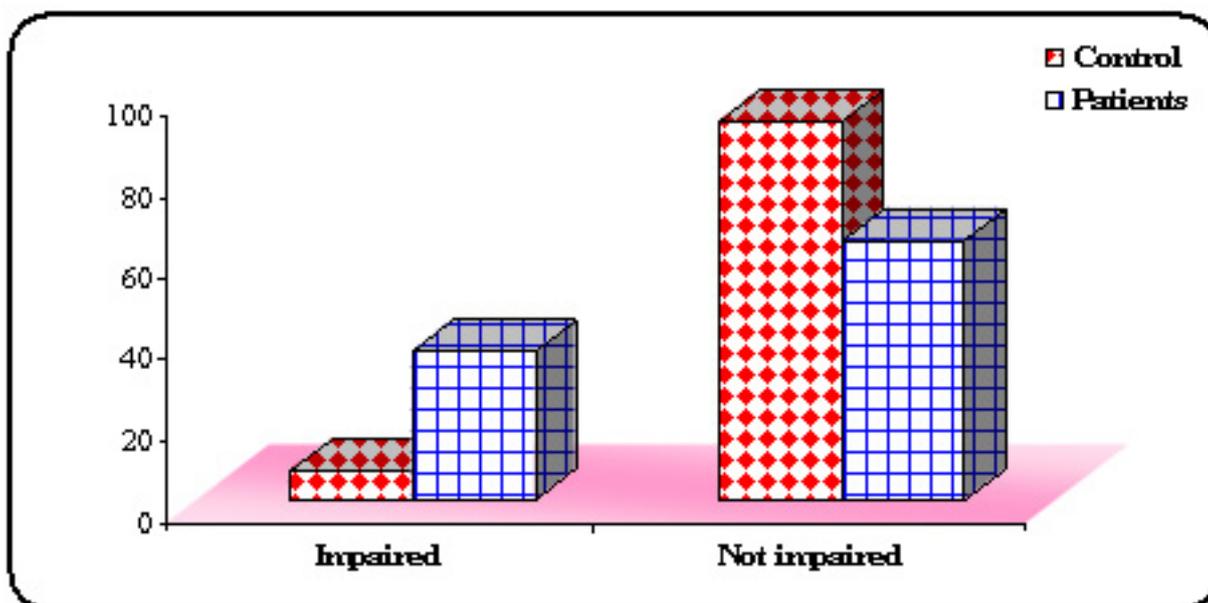
Figure 4: Comparison between the studied groups regarding the EXIT25 Test score

Gallacher et al., (2005) who conducted his study on 2205 men aged 55-69 years by using MMSE test and verbal fluency test found that men with diabetes showed cognitive deficits for verbal fluency test.

In the current study the level of education affected greatly the performance on cognitive tests with statistically significant difference. Also comparison between the studied two groups as regards the education was done and the result shows that there is no statistically significant difference. This agreed with Sinclair et al. (2000) who found that years of education were strongly associated with cognitive dysfunction in elderly patients with diabetes.

Result of current study revealed that diabetic elderly patients have impaired cognitive and executive function compared to control elderly subjects.

The diabetic subjects performed more poorly than control subjects in all neuropsychological tests of this study, and this was of statistical significance in block design, digit span, verbal fluency, clock drawing Exit 25, contrast program assessment.

This agrees with Qiu et al. (2006) who conducted a study on 291 participant of home bound older people, all people aged 60 years and older, both male and female and found lower scores on both block design and digit span among diabetics. Also it agreed with Biessels et al., (2001) who found that performance of more complex cognitive tasks such as abstract reasoning, verbal memory, and mental flexibility was worse in people with type 2 diabetes and agreed with Asimako Poulou (2001) who conducted a study on 51 people with type 2 diabetes mean age 61.5 years; 22 were female and they used a battery of cognitive tests including digit symbol forward and backward span showing poor performance of people with type 2 DM compared to people without the illness.

On the other hand two earlier studies failed to find any association between diabetes and change of cognitive function.

The first one done by Kalmijn et al. (1995) used only the MMSE a screening test which yields high specificity but poor sensitivity to study change in cognitive function and the second study was done by Atiea et al. (1995). In this study a number of factors including sample size and selection of neuropsychological tests may account for differences in findings across studies examining cognition and diabetes mellitus.

The current study showed that people with DM significantly under performed on clock drawing test and this agreed with Sinclair et al. (2000) who assessed 396 people with diabetes and 393 without diabetes who were matched for sex and age. All participants were at least 65 years old. Two tests of cognitive function were used: MMSE and Clock drawing tests; diabetic participants significantly under-performed on both tests compared to participants without DM.

The current study also revealed that older people with DM showed lower scores in verbal fluency test and this agreed with the result of 2 studies done by Grodstein et al. (2001) & Hewer et al. (2003) who found the type 2 diabetic patient had a worse score in verbal fluency test than control subjects.

The current study revealed that people with DM showed impairment in EXIT25 test and these results are agreed with by Royal et al. (1999).

It was interesting to note that the result of the current study found that duration of DM was inversely related to performance in all tests used in the study, except clock drawing test and these results might be due to large numbers of patient not doing the test, also this result was of no statistically significance except for block design test.

This result agreed with the result of 2 studies done by Grodstein et al. (2001) & Gosway et al. (2001) who found that longer DM duration was related to greater cognitive dysfunction.

Also the current study revealed that there was an association between DM and physical disability and functional status through measuring ADL and IADL. This result was statistically significant. This result agreed with Gergg et al.

(2002) & Volpatos (2002) who found similar degrees of association between diabetes and mobility problem, and activity of daily living disabilities.

In the current study the mean value of both fasting blood sugar (FBS) and 2-hour post prandial (2-hrpp) tests indicated poor control of diabetic cases and this poor control may have a role in their poorer performance in cognitive function tests. This agreed with Kalmijn et al. (1995) and Naor et al. (1997) who found a positive relationship between glycemic control and cognitive function by using both short-term (FBS) and long-term (hemoglobin A1c) indices of glycemic control. It also agrees with Awad et al. (2004) who found that diabetic patients who achieve and maintain good glycemic control had small impact on cognitive functions, however poor glycemic control produced early cognitive deficits.

References
1. American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, 4th ed., Text Revision. Washington, DC, APA, 2000, pp 147-171
2. Asimakopoulou KG (2001): Cognitive function in type 2 diabetes: relationship to diabetes self-management. phD thesis. Guildford, Surrey, UK, University of Surrey.
3. Atiea JA, Moses JL and Sinclair AJ (1995): Neuropsychological function in older subjects with non-insulin-dependent diabetes mellitus. Diabet Med;12:679-685.
4. Awad N, Gagnon M, and Messier C. (2004): The relationship between impaired glucose tolerance, type II diabetes, and cognitive function. Journal of Clinical and Experimental Neuropsychology; 26:1044-1080.
5. Biessels G, Erkelens DW and Hijman R (2001): Cognitive function in patients with type 2 diabetes mellitus. Neurosci Res Comm;28:11-22.
6. Cosway R, Strechan MWJ, Dougall, et al. (2001): Cognitive function and information processing in type 2 diabetes. Diabet Med; 18:803-810.
7. Gallacher JE, Pickering J, Elwood PC, et al. (2005): Vascular disease in men with type 2 diabetes. Eur J Epidemiol;20:761-768.
8. Gregg EW, Mangione CM, Cauley JA, et al. (2002): Diabetes and incidence of functional disability in older women. Diabetes care;25:61-67.
9. Grodstein F, Chen J, Wilson RS et al. (2001): Type II diabetes and cognitive function in community-dwelling elderly women. Diabetes Care; 24:1060-1065.
10. Hewer W, Mussell M, Rist F, et al. (2003): Short term effects of improved glycemic control on cognitive function in patients with type 2 diabetes. Gerontology;49:86-92.
11. Kalmjin S, Feskens EJM, Launer LJ, et al. (1995): Glucose intolerance, hyperinsulinemia and cognitive function in a general population of elderly men. Diabetologia; 38:1096-1102.

12. Logroscino G, Kang JH and Grodstein F (2004): Prospective study of type 2 diabetes and cognitive decline in women aged 70-81 years. BMJ.;328:7439-7548.

13. Naor M, Steingruber HJ, Westhoff K, et al. (1997): Cognitive function in elderly non-insulin-dependent diabetic patients before and after inpatient treatment for metabolic control. J Diabetes Comp; 11:40-46.

14. Qiu WQ, Price LL, Hibberd P, et al. (2006): Executive dysfunction in homebound older people with diabetes mellitus. J Am Geriatr Soc ;54:496-501.

15. Royal DR (1999): Prevalence and severity of executive cognitive impairment among diabetic outpatients Neuropsychiatry; 11:147.

16. Sinclair AJ, Girling AJ and Bayer AJ (2000): Cognitive dysfunction in older subjects with diabetes mellitus: impact on diabetes self-management and use of care services. Diabetes Res Clin Pract;50:203-213.

17. Stratta P, Prosperini P, Daneluzzo E, Bustini M, Rossi A: Educational level and age influence spatial working memory and Wisconsin Card Sorting Test performance differently: a controlled study in schizophrenic patients. Psychiatry Res 2001; 102:39-48[CrossRef][Medline]

18. Volpato S, Blaum C, Resnick H, et al. (2002): Co morbidities and impairment explaining the association between diabetes and lower extremity disability. Diabetes care;25:678-683.

Review Article

Postoperative External Dacryocystorhinostomy Complications

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ABSTRACT

Aims: To describe postoperative external dacryocystorhinostomy complications at the military hospitals of Jordan.

Method: A retrospective chart review of patients who underwent surgical external dacryocystorhinostomy for congenital or acquired naso-lacrimal duct obstruction between September 2010 and February 2013 at military hospitals of Jordan and developed postoperative complications, was conducted. The following data were extracted: age, gender, indication for surgery, site of surgery, complications, follow-up duration.

Results: Postoperative external dacryocystorhinostomy complications were encountered in 36 (18.3%) patients out of 197 patients who had external DCR, 5 (13.9%) males and 31 (86.1%) females with a male to female ratio of 1:6. The mean age was 38 years with a range of 5-70 years. Recurrent epiphora (sump syndrome) was seen in 3 (8.3%) patients, primary epistaxis in 1 (2.8%) patients, cosmetically unacceptable scar in 8 (22.2%) patients, wound dehiscence in 1 (2.8%) patient, transient lagophthalmos in 8 (22.2%) patients, transient orbicularis hypotony in 10 (27.8%) patients, cheese-wiring in 7 (19.4%) patients, extruded silicone tube in 2 (5.6%) patients, infection in 3 (8.3%), bowstring skin fold in 2 (5.6%), and retained cotton ball in the wound in1 (2.8%). The mean follow up period was 4.2 months (range 3- 6 months).

Conclusion: Postoperative external dacryocystorhinostomy were common, and some of these complications were underestimated before because of the spontaneous resolution. Recurrent epiphora was relatively rare and this may be due to the big osteotomy size that we adopt in our surgery. Other complications could be avoided by special attention to wound closure.

Key words: External, Dacryocystorhinostomy, Complications, Epiphora

Introduction

External dacryocystorhinostomy (DCR) was first described by Toti to bypass an obstructed nasolacrimal duct and is considered the standard treatment for nasolacrimal duct obstruction.(1) The surgery consists of skin incision to access the lacrimal sac and lacrimal fossa, osteotomy, mucosal flaps formation and suturing, stent placement, and wound closure. (2) Basically, this procedure is performed under general anaesthesia but with the advances in sedative techniques it is performed under local anaesthesia with intravenous sedation in the majority of cases. Although it is associated with very high success rate, (3) postoperative complications are still encountered in a few cases. The knowledge of anatomy and meticulous surgical technique decrease the risk of postoperative complications. Modifications and advancement have been introduced to decrease the frequency of these complications as well. (4)

The most frequent postoperative complications is persistent or recurrent tearing and other less frequently reported complications are retro-bulbar orbital hemorrhage,(5) incision necrosis,(6) cutaneous scarring,(7) wound infection and granuloma formation,(8,9) corneal abrasion,(10) cerebrospinal fluid leak,(11) retained stenting material,(12) secondary hemorrhage,(13) diffuse cervicofacial subcutaneous emphysema and pneumomediastinum,(14) rhinolith formation,(15) meningitis and pneumocephalus,(16) retained gauze,(17) orbital emphysema,(18) and lagophthalmos and orbicularis oculi weakness.(19)

This study was conducted retrospectively to describe postoperative external dacryocystorhinostomy complications at the military hospitals of Jordan between September 2010 and February 2013.

Methods

A retrospective chart review of patients who underwent surgical external dacryocystorhinostomy for congenital or acquired naso-lacrimal duct obstruction between September 2010 and February 2013 at military hospitals of Jordan and developed postoperative complications, was conducted. The following data were extracted: age, gender, indication for surgery, site of surgery, complications, follow-up duration.

Inclusion criteria included patients who developed clinical signs of postoperative complications.

The local ethical committee of the Royal Medical Services approved the study.

Results
Out of 197 patients who had external DCR, postoperative complications were encountered in 36 (18.3%) patients, 5 (13.9%) males and 31 (86.1%) females with a male to female ratio of 1:6. The mean age was 38 years with a range of 5-70 years. The average age of males was 14 years and for females 42 years. The right side was involved in 20 (55.6%) patients and 1 (2.8%) patient had bilateral external DCR. The main indication for surgery was acquired nasolacrimal duct obstruction with mucocele in 28 (77.8%) patients followed by congenital nasolacrimal duct obstruction in 8 (22.2%) patients. Local anaesthe-

sia with intravenous sedation was used in 19 (53%) of patients. Straight Bodkin silicone stents were used in all cases. Diagonal skin incision was adopted in all patients starting halfway between the midline of the face and the medial canthus at the level of the medial canthus and directed downward toward the lateral end of the ala nasi. Table 1 (opposite page) shows the percentages of complications encountered postoperatively with the transient orbicularis hypotony, transient lagophthalmos, and hypertrophic scar being the most frequent complications. Rare complications such as subcutaneous emphysema, and retained cotton ball in the wound were encountered in 2 (5.6%) patients. The mean follow up period was 4.2 months (range 3-6 months).

Discussion

External DCR is one of the commonest oculoplastic surgeries, used to treat patients with epiphora due to nasolacrimal duct obstruction; although it has a high success rate postoperatively it has some insignificant complications.

The postoperative external DCR in our study was 18.3% which agrees with other previous studies.

In our study females significantly predominate males with male to female ratio of 1:6 and this was similar to most of previous studies but more than Besharati(25) in Iran, and this can be explained by females' worrying in our country about their eyes' beauty as most of the indications in our study was mucocele that causes disfiguring of the medial canthus.

In most of the cases local anesthesia with sedation was the favorable technique in external DCR (5). About half of our cases had local anesthesia with intravenous sedation and this was because our study included all age groups (5-70 years) where general anesthesia was used in young patients.

The commonest complications encountered in our study were hypometric blink with or without lagophthalmos (20, 21). These complications were first seen in 1994 when Fayet et al, (19) reported immediate temporary lagophthalmos after external DCR. In our study these were very common because we were specifically looking for these complications to rule out exposure keratopathy after the publication of facial nerve injury in 2009 by Vagefi et al. (22) These complications were transient and resolved within two weeks but lubricant should be used to prevent exposure keratopathy.

Recurrent epiphora was seen in 8.3% of patients and this was slightly less than previously reported studies where the failure rate ranged between 8 and 10% of cases. This lower rate of complications is due to large osteotomy that we do in all our cases and this was proved by Simon et al(23) who found that large osteotomy in DCR surgery is associated with a high success rate.

In all cases the skin incision was done on the lateral wall of the nose where it is known to have good healing and acceptable scar. In our case hypertrophic scar was found in 22.2% and this was comparable to a study done by Devoto et al (24) which showed 15 of 34 patients (44%) could not see their incision site (grade 0), 16 of 34 (47%) graded it as

	Male	Female	Total
	5 (13.9%)	31 (86.1%)	
Age range (average)	10-26 (14)	5-70 (42)	5-70 (38)
Recurrent epiphora	2 (5.6%)	1 (2.8%)	3 (8.3%)
Bleeding	0	1 (2.8%)	1 (2.8%)
Hypertrophic Scar	1 (2.8%)	7 (19.4%)	8 (22.2%)*
Infection	0	3 (8.3%)	3 (8.3%)*
Wound dehiscence	0	1 (2.8%)	1 (2.8%)
Transient lagophthalmos	2 (5.6%)	6 (16.7%)	8 (22.2%)*
Transient orbicularis hypotony	2 (5.6%)	8 (22.2%)	10 (27.8%)*
Cheese-wiring	1 (2.8%)	6 (16.7%)	7 (19.4%)*
Skin bowstring	0	2 (5.6%)	2 (5.6%)*
Subcutaneous emphysema	0	1 (2.8%)	1 (2.8%)
Silicone tube extrusion	0	2 (5.6%)	2 (5.6%)
Retained cotton ball in the wound	0	1 (2.8%)	1 (2.8%)
Tight tube	1 (2.8%)	4 (11.1%)	5 (13.9%)*

*Patients had more than one complication.
Table 1: Postoperative external dacryocystorhinostomy complications

moderately visible, and no patient graded it as very visible. All patients were satisfied with the appearance of their incision six months after surgery. Another study done by Sharma et al (7) showed 61 of 296 scars (20.6%) were felt to be visible by patients.

Postoperative DCR bleeding was reported in our study in one patient (2.8%) and this was relatively similar to a study done by Karim et al (10) who also report one case (1%) of postoperative DCR bleeding.

As we know the wound infection is seen in many surgeries; in our study the ratio of this complication was 8.3% (3 cases)

which was slightly higher than that done by Besharati (25) who found 5.3% of wound infection.

Other rare complications were reported in our study such as: Subcutaneous emphysema (Figure 1), retained cotton ball in the wound, wound dehiscence (Figure 2), bowstring skin fold (Figure 3) and extrusion of silicon tube (Figure 4), cheese-wiring (Figure 5).

(See Figures next page)

Figure 1: Subcutaneous emphysema

Figure 2: wound dehiscence

Figure 3: bowstring skin fold

Figure 4: extruded silicone tube

Figure 5: cheese- wiring of upper and lower puncti

In conclusion: postoperative external dacryo-cystorhinostomy were common, and some of these complications were underestimated before because of the spontaneous resolution. Recurrent epiphora was relatively rare and this may be due to the big osteotomy size that we adopt in our surgery. Other complications could be avoided by special attention to wound closure.

References

1. Toti A. Nuovo metodo conservatore di cura radicale delle suporazioni croniche del sacco lacrimale (dacriocistorinostomia). Clin Mod Firenze 1904;10:385-389.

2. Welham RA, Wulc AE. Management of unsuccessful lacrimal surgery. Br J Ophthalmol 1987;71(2):152-157.

3. Mathew MR, McGuiness R, Webb LA, et al. Patient satisfaction in our initial experience with endonasal endoscopic non-laser dacryocystorhinostomy. Orbit 2004; 23: 77-85.

4. Caesar RH, McNab AA. External dacryocystorhinostomy and local anesthesia: technique to measure minimized blood loss. Ophthal Plast Reconstr Surg 2004 Jan; 20(1):57-59.

5. McNab AA, Simmie RJ. Effectiveness of local anaesthesia for external dacryocystorhinostomy. Clin Experiment Ophthalmol 2002; 30(4):270-272.

6. Salour H, Montazerin N. Incision site tissue necrosis after dacryocystorhinostomy. Ophthal Plast Reconstr Surg 1998; 14(2): 146-148.

7. Sharma V, Martin A, Benger R, et al. Evaluation of the cosmetic signi?cance of external dacryocystorhinostomy scars. Am J Ophthalmol 2005; 140 (3): 359-362.

8. Walland MJ, Rose GE. Soft tissue infections after open lacrimal surgery. Ophthalmology 1994; 101: 608-611.

9. Kerendian J, Conn H. Lipogranuloma: a preventable complication of dacryocystorhinostomy. Ophthalmic Surg Lasers. 1996; 27(8): 713-715.

10. Karim R, Ghabrial R, Lynch T, Tang B. A comparison of external and endoscopic endonasal dacryocystorhinostomy for acquired nasolacrimal duct obstruction. Clin Ophthalmol. 2011; 5: 979-89. Epub 2011 Jul 12.

11. Fayet B, Racy E, Assouline M. Cerebrospinal fluid leakage after endonasal dacryocystorhinostomy. J Fr Ophtalmol 2007; 30(2):129-134.

12. Bolger WE, Crawford J, Cockerham KP. Retained stenting material: an unusual cause of dacryocystorhinostomy failure. Ophthalmology 1999; 106(7): 1306-1309.

13. Ben Simon GJ, Cheung N, McNab AA. Delayed epistaxis in external dacryocystorhinostomy: rate and risk factors. Arch Otolaryngol Head Neck Surg 2010; 136 (2): 183-186.

14. Shackelford D, Casani JA. Diffuse subcutaneous emphysema, pneumomediastinum, and pneumothorax after dental extraction. Ann Emerg Med 1993; 22(2): 248-250.

15. Levy J, Monos T, Puterman M. Rhinolithiasis: a very late complication after dacryocystorhinostomy with rubber-gum and polyethylene stenting. Am J Ophthalmol 2004; 138(6): 1065-7.

16. Usul H, Kuzeyli K, Cakir E,et al. Meningitis and Pneumocephalus. A rare complication of external dacryocystorhinostomy. J Clin Neurosci 2004; 11(8): 901-2.

17. Kerendian J, Conn H. Lipogranuloma: a preventable complication of dacryocystorhinostomy. Ophthalmic Surg Lasers. 1996; 27(8): 713-715.

18. Ghosheh F, Kathuria S. Massive subcutaneous emphysema mimicking necrotizing fasciitis after dacryocystorhinostomy. Ophthal Plast Reconstr Surg 2005; 21: 389-391.

19. Fayet B, Bernard JA, Ritleng P, Assouline M, Pouliquen Y. Internal transient palpebral inclusion following dacryocystorhinostomy. J Fr Ophtalmol. 1994; 17(3): 195-9.

20. Asma A, Marina MB, Mazita A, Fadzilah I, Mazlina S, Saim L. Iatrogenic facial nerve palsy: lessons to learn. Singapore Med J 2009; 50(12): 1154-1157.

21. Dew LA, Shelton C. Iatrogenic facial nerve injury: prevalence and predisposing factors. Ear Nose Throat J 1996; 75(11): 724-9.

22. Vagefi MR, Winn BJ, Lin CC, Sires BS, et al. Facial Nerve Injury during External Dacryocystorhinostomy. Ophthalmology 2009; 116: 585-590.

23. Guy J. Ben Simon, MD; Chris Brown, MD; Alan A. et al. Larger Osteotomies Result in Larger Ostia in External Dacryocystorhinostomies. ARCH FACIAL PLAST SURG/VOL 14 (NO. 2), MAR/APR 2012.

24. Devoto MH, Zaffaroni MC, Bernardini FP, de Conciliis C. Postoperative evaluation of skin incision in external dacryocystorhinostomy. Ophthal Plast Reconstr Surg. 2004; 20(5):358-61.

25. Besharati MR, Rastegar A. Results and complications of external dacryocystorhinostomy surgery at a teaching hospital in Iran. Saudi Med J. 2005 Dec;26(12):1940-4.

Health Status of Elderly: A Study on Godagari Upazila, Bangladesh

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ABSTRACT

Objective: Ageing not only affects a person's looks but also becomes a cause of physical deterioration and a number of physiological changes. This article focuses on the health status of the elderly living in Godagari Upazila of Rajshahi district, Bangladesh.

Methodology: The data for the study were collected from 344 people having age 60+ and living in four unions (local administrative unit) of Godagari Upazilla (namely Mohonpur, Rishikul, Matikata and Basudebpur) of Rajshahi district, Bangladesh, using simple random sampling technique.

Results: The results indicate that most of the elderly, both male and female, are unhealthy and suffering from two or more diseases. The most common health problems elderly people are facing include Gastric, eye sight and paralysis. The health status of women is found to be poorer than men.

Conclusion: Elderly is a serious reality of our life cycle and elderly people are considered to be the asset of a nation as their experience, wisdom and knowledge can be used for the national reconstruction. So, let the policy-makers come forward to develop specific action plans for the well-being of elderly people of Bangladesh.

Keywords: Health status, elderly and Bangladesh.

Introduction

Health is the level of functional or metabolic efficiency of a living being. WHO (1946) defined health in its broader sense as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. Ageing is a natural and multi dimensional process and it is generally defined as a process of deterioration in the functional capacity of an individual that results from structural changes with the advancement of age.

A changing demographic structure is happening worldwide with a gradual transfer towards a higher proportion of older people. A declining trend in both fertility and mortality rates has improved average life expectancy and created a new set of challenges in today's society. The number of older people is increasing rapidly in low-income countries. The net increase of older population worldwide is about one million every month, two-thirds of them in the low-income countries (Gorman, 2002). In recent years, as population ageing has grown into a "defining global issue" (HelpAge International, 2002), concerns have emerged regarding policy interventions appropriate for older people (Gorman & Heslop, 2002; Barrientos & Lloyd-Sherlock, 2002), especially in the area of elderly health care.
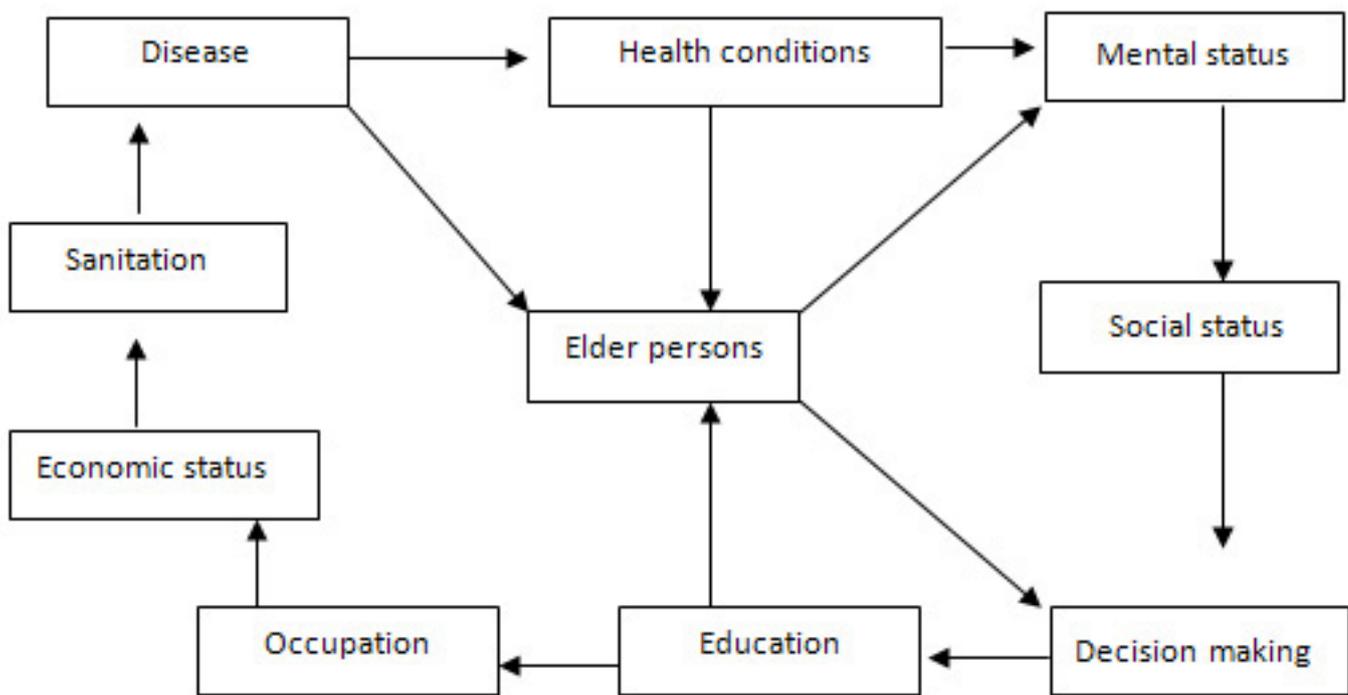
Figure 1: Social-economic variables and health status of elderly (Balamurugan and Ramathirtham, 2012)

Health status of the aged population is influenced by a number of factors. Education is the determinant of occupation. It is obvious that every educated person would like to hold service as a major occupation. On the other hand, most of the illiterate persons are farmers. In this way, education influences occupation. In Bangladesh, better occupation means better economic status and better sanitation facilities (Rahman, 2009). Sanitation facilities mostly affect diseases. Diseases also influence health condition. Those who have sound health have also better mental and social status. That is, there is a close relation between these factors. Education, diseases and health condition significantly affect the older persons. Mental status, social status and decision making influence aged persons. In lieu of these factors, the status of health of the elderly can be analyzed by using a simple framework.

In Bangladesh, population ageing is viewed as a natural outcome of demographic transition from high fertility and mortality to low fertility and mortality due to the years of successful family planning (FP) and public health programs that have changed the population growth of the country (Strong, 1992). This changing situation is causing problems and unhappiness to the life of many elderly and has endangered their well-being and survival. Every year approximately 80,000 new elderly are entered into the group of the older persons. The estimates and projections show that the amount is certain to increase markedly with time (Abedin, 1996). Such growing numbers of the aged population have laid down several issues related to their status and roles, care and living arrangements, health, social support and overall well-being of the elderly. A rapid increase in elderly as well as their proportion in the population has led us to being more conscious about social, economical, psychological and health problems of the elderly in Bangladesh. Of these, health related problems are generally considered to be more important as they affect a large majority of the elderly. It is very important to comprehend the health needs of the elderly and so solicit their opinion in improving the existing health care system in the country. So, this article is undertaken to study the problems of the elderly with a special focus on health issues in Godagari Upazila of Rajshahi district, Bangladesh.

Methods and Materials

The data for this study were collected from four unions (local administrative unit) namely Mohonpur, Rishikul, Matikata and Basudebpur in Godagari Upazilla of Rajshahi district, Bangladesh. Three hundred and forty four people (about 22% of the total population of the unions) aged 60+ years were selected using simple random sampling technique and were successfully interviewed through personal interview method of which 50% are male and 50% are female. Among the various well known statistical tools, frequency distribution and percentage distribution were used. Statistical Package for Social Sciences (SPSS), the most convenient program for data analysis for social sciences, was used to analyze the entire data. Besides, several types of books, journals and research papers were used as secondary sources.

Results

The vulnerability to be stricken by disease at old age increases with the increase of age. Normally in rural aresa of Bangladesh, the availability of health care facilities is beyond the satisfactory level. Both aged and young people in the rural areas can hardly afford to avail health facilities. Aged persons with coughing or lying down on bed with arthritis or any other disease is very much a common scenario of rural Bangladesh. Negligence, poverty, prejudice etc. allows the rural aged to be kept aloof from availing modern medical care. The names of diseases, from which the respondents are suffering, are Heart disease, Diabetes Mellitus, Respiratory disease, Hypertension, Arthritis, Bronchogenic, Carcinoma, Cataract, Cancer, Anemia, Asthma, Urinary, TB, Flatulence, Constipation, Diarrhea, Hiccup Alzheimer's disease, Depression, Mental stress, Feelings of insecurity, etc.

Prevalence of diseases
In order to assess the health status of the elderly, they were asked about some health related questions; such as whether they have any health problems, types of health problems, types of treatments they usually received etc.

From Table 1, it is revealed that about 88% of the elderly (both sexes) suffer from some sort of health problems. This prevalence is higher for females (about 89% suffer from some sort of health problems) than their male counterparts (about 86% suffer from some sort of health problems).

Table 1: Percentage distribution of respondents as to whether they have any types of health problems

Ailment	% Of sufferers among sex		% Of sufferers in total sample
	Male	Female	Both sexes
Yes	149(86.6)	153(89.0)	302(87.8)
No	23(13.4)	19(11.0)	42(12.2)

Note: Values in the parentheses indicate percentage figure.

From Table 2, it is observed that about 9.9% of the respondents are suffering from Gastric complaints, 7.9% from Cataract of eyes, 7.6% from Paralysis, 4.3% from Physical pain, and 4.0% from Asthma. The problems of Gastric nature and Cataract of eyes are more acute to male respondents than the females. The results also show that 7.8% of the female respondents are suffering from Paralysis, at the same time; this number is 7.4% for males. Table 2 also indicates that 52.3% of the male respondents, 60.8% of the female respondents and 56.6% of the total respondents are suffering from more than one disease.

Table 2: Distribution of respondents suffering from different types of diseases

Type of diseases	Male	Female	Total
Diabetic	3(2.0)	0(0.0)	3(1.0)
High blood pressure	2(1.3)	6(3.9)	8(2.6)
Heart disease	1(0.7)	2(1.3)	3(1.0)
Asthma	9(6.0)	3(2.0)	12(4.0)
Skin diseases	1(0.7)	0(0.0)	1(0.3)
Dysentery	0(0.0)	1(0.7)	1(0.3)
Cataract of eyes	15(10.1)	9(5.9)	24(7.9)
Gastric	18(12.1)	12(7.8)	30(9.9)
Cancer	2(1.3)	0(0.0)	2(0.7)
Paralyzed	11(7.4)	12(7.8)	23(7.6)
Anemia	1(0.7)	0(0.0)	1(0.3)
Pain in belly	2(1.3)	1(0.7)	3(1.0)
Feel physical pain	3(2.0)	10(6.5)	13(4.3)
Headache	0(0.0)	4(2.6)	4(1.3)
TB	1(0.7)	0(0.0)	1(0.3)
Legless	1(0.7)	0(0.0)	1(0.3)
Ake shira	1(0.7)	0(0.0)	1(0.3)
Combination of two or more diseases	78(52.3)	93(60.8)	171(56.6)

Note: Values in the parentheses indicate percentage figure.

Types of treatments received
Ensuring proper treatment is one of the fundamental rights of human beings. But poor people living in rural areas can't manage their meals whereas regular visits to doctors are so far away. Besides, health facilities are not frequent in rural Bangladesh; people are not so conscious in regard to health. That is why, rural people can't maintain a frequent and regular visit to doctors. Another thing is that our rural society is conservative in attitude towards women either aged or young or girls. This is another reason for women to be refrained from frequent visits to doctors.

The study shows that only 29% of the aged who had suffered from various diseases received some sorts of treatments on a regular basis. In consideration of gender, female aged are less frequent than males. The results show that only 23.8% of the aged

females received some sorts of treatments on a regular basis whereas this figure is 34.3% for male aged (Table 3).

Table 3: Distribution of the respondents in terms of visiting to doctor regularly

Visiting to doctor	Male	Female	Total
Yes	59(34.3)	41(23.8)	100(29.1)
No	113(65.7)	131(76.2)	244(70.9)

Though not regularly but when rural people find no other way, they have to go to doctors. That means, when one is stricken with severe disease, it makes rural people go to a doctor. Previously, the first preference of rural people was village kaboraj. But now people's perception has been modified. From Table 4, it is shown that most of the aged prefer and have faith in allopathic treatment. About 80% of the aged prefer to take treatment from the allopathic doctors. Only 5.8% of the aged chose homoeopathic treatment. On the other hand, about 6% of the respondents go for "mantra" because of their conservatism.

Table 4: Distribution of the respondents by type of treatment received

Treatment types	Male	Female	Total
Allopathic	132(76.7)	136(79.1)	268(77.9)
Homeopathic	9(5.2)	11(6.4)	20(5.8)
Allopathic and homeopathic	4(2.3)	1(0.6)	5(1.5)
Kabiraj	4(2.3)	2(1.2)	6(1.7)
Mantra	6(3.5)	14(8.1)	20(5.8)
Homeopathic and mantra	1(0.6)	2(1.2)	3(0.9)
Homeopathic, kabiraj and majar	1(0.6)	0(0)	1(0.3)
Allopathic and kabiraj	3(1.7)	3(1.7)	6(1.7)
Allopathic and mantra	8(4.7)	2(1.2)	10(2.9)
Allopathic and majar	1(0.6)	0(0.0)	1(0.3)
Homeopathic and kabiraj	3(1.7)	1(0.6)	4(1.2)

Discussion

The traditional norms and values of Bangladeshi society stress respect and provision of care for the elderly. The ongoing processes of urbanization, industrialization, modernization, globalization and their concomitant processes have led to changes in the traditional support base of the elderly. This has resulted in declining possibilities of family care, co-residence has become difficult and a separate existence is challenging due to issues of access to basic facilities and physical security. From this study, it is found that about 88% of the respondents reported that they are suffering from some type of illness. Gender wise differences are also found in the health status of the elderly respondents. Compared to men, the health status of women is found to be poorer. This might be due to under nourishment associated with cultural practices in Bangladesh especially in rural areas. Moreover, the diseases specific to women and other natural biological processes, which the women may undergo, could be some of the reason for the overall low health status of women. Higher numbers of respondents reported difficulties pertaining to gastric (30%) and paralysis (23%).

Conclusion

Population ageing is emerging as a serious issue in Bangladesh and is becoming a serious concern for the development agendas. The number and types of variables and their extent of influence on the elderly health status (both apparent and genuine) vary. The pattern of various inputs for developing a suitable social policy for the welfare of the elderly may also

have to be duly modified in view of the living conditions of the elderly. So, the findings are unique in many respects and should have extensive (theoretically and methodologically) policy and program implications in the programs meant to improve the quality of life of the elderly.

References

Abedin S. (1996). Population Ageing in Bangladesh: Issues and Perspectives', Summary of Country Paper, ESCAP Asian Population Studies, Series No.145.

Barrientos A. & Lloyd-Sherlock P. (2002). Policy Arena, Older and Poorer? Ageing and Poverty in the South, Journal of International Development, 14: 1129-1131.

Balamurugan J. and Ramathirtham G. (2012). Health Problems of Aged People, International Journal of Research in Social Sciences, Vol. 2, No. 3, 2012, ISSN: 2249-2496.

Gorman M. (2002). Global Ageing - the Non-Governmental Organization Role in the Developing World. International Journal of Epidemiology, 31: 782-785.

Gorman M. & Heslop A. (2002). Poverty, Policy, Reciprocity and Older People in the South, Journal of International Development, 14: 1143-1151.

HelpAge International (2000). Uncertainly Rules over Lives: The Situation of Older People in Bangladesh, London: HelpAge International.

Rahman M. M. (2009), Health Status and Health Needs among the Aged Population in Chapai Nawabganj District of Bangladesh, Indian Journal of Gerontology, Vol. 23, No. 1. pp. 32 -41.

Strong M. A. (1992). The Health of Adults in Developing World: the View from Bangladesh, Forum; Adult Mortality, World Bank Publication.

World Health Organization (1946). Definition of Health, Preamble to the Constitution of the World Health Organization as Adopted by the International Health Conference, New York, 19-22, June 1946 (Official Records of the WHO, No. 2, p. 100) and entered into force on 7 April, 1948.

Implementation of ventilator bundle in prevention of ventilator associated pneumonia

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ABSTRACT

Background: Ventilator Associated Pneumonia (VAP) increases the morbidity and mortality rates.

Objectives: (i) diagnose VAP cases among mechanically ventilated patients, (ii) estimate the incidence rate of VAP per 1000 ventilation days, (iii) evaluate the role of colonization and ventilator bundle implementation in prevention of VAP.

Methods: A Comparative Prospective study was conducted on 100 intubated mechanically ventilated patients who were admitted in Geriatric ICU, and divided into two groups: Group (1): 50 patients before implementation of VAP bundle & group (2): 50 patients after implementation of VAP bundle. Microbiological examination of oral colonization and Endotracheal aspirate specimens were done; diagnosis of VAP was based on CDC [1]. Clinical Audit was performed on bundle elements before and after implementation using VAP care bundle checklist.

Results: Total VAP rate was 59.2/1000 ventilator days. VAP rate in group (1) was 71.4 which decreased significantly to 46.1/1000 ventilator days in group (2). VAP care bundle score was significantly higher in group (2) than group (1); the compliance for each element in group (2) was higher significantly than group (1) as regards: Head of bed elevation, hand washing, oral care, PUD prophylaxis & removal of subglottic secretions.

Conclusion: Implementation of VAP care bundle had reduced the VAP rate.

Keywords: Ventilator bundle, Ventilator Associated Pneumonia, Geriatric intensive care unit.

Introduction

Ventilator-Associated Pneumonia (VAP) is a form of nosocomial pneumonia that occurs in patients receiving mechanical ventilation for longer than 48 hours. The risk of pneumonia increases 3 to 10 fold in patients receiving mechanical ventilation. Furthermore, the incidence of VAP reaches 22.8% among ventilated patients [2].

The pathophysiology of VAP involves 2 main processes: colonization of the respiratory and digestive tracts due to spread of organisms from many different sources, and micro-aspiration of secretions of the upper and lower parts of the airway [3].

The risk factors for VAP can be divided into 3 categories: patient related, device related, and staff related [4].

The American Association of Critical-Care Nurses recommended steps for reducing the incidence of VAP; these steps are based on the best practice guidelines for patients receiving mechanical ventilation (ventilator bundle) [5].

A number of studies have demonstrated the positive impact of implementation of the Ventilator Bundle or a modified VAP bundle on the reduction of VAP in ICUs. But, many of these are difficult to interpret as they do not report bundle compliance rates, and do not control for other specific VAP risk factors [6].

Whether implementation of Ventilator Bundle has a role in prevention of VAP is our study question and whether oral colonization has a significant role in development of VAP or not.

Subjects and Methods

Study population

A prospective study was conducted on 100 intubated mechanically ventilated patients who were admitted in Geriatric ICU in Ain Shams University Hospital over a period of 6 months from May to October, 2011 in collaboration with central microbiology laboratory unit. The study was approved by the ethical committee of the Faculty of Medicine, Ain Shams University. VAP cases were 2 groups (Group 1): 50 patients before implementation of VAP care bundle in first 3 months, (Group 2): 50 patients after implementation of VAP care bundle in the second 3 months.

Patients' Exclusion criteria:

• Evidence of chest infection prior to intubation.
• Intubated patients re-admitted from another hospital.

Data collection:

Full history taking regarding age, gender, clinical diagnosis, cause and duration of mechanical ventilation, antimicrobial treatment.

Diagnosis of suspected cases of VAP:

Based on clinical, radiological findings according to NNIS and CDC criteria [1] in association with microbiological examination of Endotracheal aspirate (ETA). In this pre-interventional and post-interventional study, we compared VAP rates before and after implementation of VAP care bundle.

Microbiological processing:

• *Examination of oral swab:*
Samples were obtained by taking oral swabs from the dorsal surface of the tongue. Isolation of organisms was done according to conventional culture technique. Oral colonization density was performed roughly as follows: Light, moderate, heavy colonization [7].

• *Microbiological examination of ETA of VAP cases*
A suction catheter was placed into the endotracheal tube until resistance was met, and blindly wedged into a distal bronchus under complete sterile conditions. Gentle aspiration was performed without installing saline solution; the first aspirate was discarded, and the second aspirate was collected for evaluation. The ETA was delivered to the microbiological laboratory immediately as soon as it was collected. Acceptable ETA samples were containing less than 10 SEC / average 10 x field [8]. Endotracheal aspirate samples were mechanically liquefied and homogenized by vortexing for 1 min, followed by centrifuging at 3,000 rpm for 10 minutes. Samples were aseptically cut and placed in a sterile tube containing 1 ml of 0.9% saline solution and vortexed for 1 minute. Specimens were serially diluted in 0.9% sterile saline solution. The specimens were then plated into the following agar media: 5% sheep blood, chocolate, and McConkey agar. All cultures were incubated at 37°C under aerobic in a carbon dioxide enriched atmosphere. Plates were evaluated for growth at 24 and 48 hours and discarded after five days. The number of bacteria in the original sample was expressed in colony-forming units (cfu) per milliliter. All micro-organisms were identified using standard laboratory methods. The threshold for positive culture defining pneumonia was 104cfu/ml [9].

Clinical Audit on VAP care bundle according to IHI [10].

For adoption and compliance with bundle elements before and after care bundle implementation using VAP bundle checklist (Table 1 - opposite page).

Design and Time schedule:

• *Pre-interventional period*
For detecting malpractice when dealing with intubated mechanically ventilated patients, and training and education for medical staff for best practices of VAP care bundle elements.
• *Post interventional period*
For re-audit to detect practice improvement of VAP care bundle elements.

Interpretation of VAP bundle checklist:

- Checklist was applied for each patient with a total score of 14 for each patient.
Two methods were applied for evaluation of performance of VAP care bundle among the studied two groups:
• Calculation of VAP care bundle score in the two studied groups either:
- Per bundle = summation of the patients score/total score x 100
- Per element = element done for every patient x 2 [11].
• Calculation of the compliance percent of VAP bundle per element.

Elements	0*	1*	2*
• Elevation of the Head of the Bed 45 degrees	30	- 0	70
• Daily "Sedation Vacations" and Assessment of Readiness to Extubate	66	- 0	34
• Peptic Ulcer Disease Prophylaxis	58	- 0	42
• Deep Venous Thrombosis Prophylaxis	54	- 0	46
• Oral care with chlorhexidine	48	- 0	52
• Continuous removal of subglottic secretions.	40	- 0	60
• Washing of hands before and after contact with each patient	80	- 0	20

*0 not done *1 not done correctly *2 well done
Table 1: Ventilator Associated Pneumonia (VAP) bundle check list

Rate	Group (1) N=50	Group (2) N=50	Total	P value	Sig
Incidence rate	100 %	60 %	80 %	<0.05	S
Incidence density	71.4/1000	46.1/1000	59.2/1000	<0.05	S
Mortality rate	72 %	48%	60 %	<0.05	S

P<0.05 is significant
Table 2: Calculation of VAP rates among the two groups

	Score	t-test	p-value	Sig
Group (1) (n = 50)	33.1	27.735	0.000	HS
Group (2) (n = 50)	59.1			

P<0.001 is highly significant
Table 3: Comparison between the two studied groups as regards VAP care bundle score

Total VAP care bundle element compliance percent = number of the actual patients were the element that had been performed/total number of the patients x100 [12].

Statistical Analysis:
The collected data was revised, coded, tabulated and analyzed using Statistical Package for Social Science (SPSS 15.0.1 for windows; SPSS Inc, Chicago, IL, USA 2006). Data was expressed as mean ± SD. Significant group differences were compared by One-Way ANOVA test. Linear relationship between key variables was tested by Pearson's correlation coefficient. Chi-Square $(X2)$ /Fisher's exact, was also done. The probability of error (P value) < 0.05 was considered significant, while no statistical significance was detected at P>0.05.

Results
One hundred intubated mechanically ventilated patients were involved in the study. It was noticed that VAP developed in 80/100 (80%) of the patients with VAP rate 59.2/1000 ventilation days which showed a significant decrease from 71.4 in group (1) to 49.1 in group (2) p <0.05 (Table 2). As regards VAP care bundle compliance score, it was higher in group (2) than group (1) with highly statistically significant

difference p<0.001 (Table 3). The compliance for each element in group (2) was higher significantly than group (1) with a highly significant difference p <0.001 as regards chlorhexidine oral care. However, Head of bed elevation, hand washing, PUD prophylaxis and subglottic secretions showed significant difference p <0.05 (Table 4). As regards the comparison between oral colonization density among the two studied groups, it was higher statistically in group (1) than group (2) as 40/50 (80%), 12/30 (40%) were heavily colonized respectively (P > 0.05). As regards the results of quantitative ETA cultures of VAP cases, it revealed a polymicrobial significant growth >104cfu/ml in 68/80 (85%) of VAP cases with predominance of gram negative organisms mainly klebsiella, pseudomonas and acinetobacter, while the remaining 12 cases showed no growth. However, the detected organisms showed no statistical significant difference with oral swab cultures (P > 0.05).

As regards the association between oral colonization and VAP cases, there was a highly statistically significant association between them (P < 0.001) (Table 5). The odds ratio for the occurrence of VAP in the presence of oral colonization was 6.714 times more than non-colonized cases with 95% CI (3.39-13.39).

Elements	Group 1	Group 2	P value	Sig.
Head of Bed Elevation	60	80	0.02	S
Hand washing	12	28	0.04	S
Oral care	28	76	0.001	HS
PUD Prophylaxis	24	60	0.05	S
DVT Prophylaxis	40	50	0.53	NS
Assess readiness to extubate	28	40	0.47	NS
Removal of subglottic secretions.	40	80	0.05	S

-Peptic Ulcer Disease (PUD) -Deep Venous Thrombosis (DVT)
p>0.05, non significant
Table 4: The score of VAP care bundle per elements in the two studied groups

Elements	Group 1 (50)		Group 2 (50)		P-value	Sig.
	No.	%	No.	%		
Head of Bed Elevation	30	60%	40	80%	0.009	S
Hand washing	6	12%	14	29%	0.03	S
Chlorhexidine Oral care	14	28%	38	76%	0.001	HS
PUD Prophylaxis	12	24%	30	60%	0.02	S
DVT Prophylaxis	20	40	26	52%	0.57	NS
Assess readiness to extubate	14	28%	20	40%	0.55	NS
Removal of subglottic secretions	20	40%	40	80%	0.019	S

-Peptic Ulcer Disease (PUD) -Deep Venous Thrombosis (DVT)
Table 5: The compliance of VAP care bundle elements in the two studied groups

However, there was a highly significant association between the density of oral colonization and occurrence of VAP, as 65% of VAP cases were heavily colonized while the non VAP cases did not have heavy colonization and this was highly significant (P < 0.001).

As regards demographic details of the VAP patients :

• The predominant gender was the female gender 50/80 constituting (62.5%).
• The age of the patients ranged from (50 to 90 years) with mean age (65 ± 13.5 SD).
• Associated co-morbidities mostly were hypertension (67.5%), diabetic coma (21%), smoking (10%) and chronic liver diseases (15%). However, there was no significant difference between the two groups as regards medical co-morbidities (p>0.05).
• Thirty out of 80 (37.5%) patients were subjected to re-intubation.
• Causes of intubation were ARDS (5%), post arrest (50%), type 2 respiratory failure (12.5%), persistent hypoxia (7.5%), and coma due to neurological causes (25%).

Discussion
VAP is the most common Health care-associated infection (HAI) among critically ill patients admitted to the ICU resulting in high morbidity and mortality [13].

As regards the incidence density of VAP in this study, it was 59.2 per one thousand ventilator days. This was nearly similar to the result of NNIS [14] that showed 54.9 per one thousand ventilator days for medical-surgical ICU, also Arabi et al. [11] stated that VAP rate in developing countries varies from 10 to 41.7 per one thousand ventilator-days, but it is higher than in a study done by Edrem et al. [15] as the incidence was 22.6 per one thousand ventilator days. Edwards et al. [16] found a mean VAP rate of 3.6 per one thousand ventilator days in medical-surgical ICUs. This variation is probably due to several factors including differences in patient population especially age and sample size, variability in co-morbidities, and compliance in infection control practice.

In the current study ETA were analyzed for suspected cases of VAP quantitatively. This agrees with Deven et al. [17] who preferred ETA as a method to obtain lower respiratory secretions.

As regards the demographic data of VAP cases, the majority of the patients were geriatric females above 60 years among the two groups. This finding agrees with Awad [18] who reported that the incidence of VAP in females was higher than males in the geriatric age group. This disagrees with Beers and Berkow [19] who stated that VAP was more common in males than females; this may be due to the higher incidence of cigarette smoking, and exposure to some occupational hazards.

In the present study there was a significant (40 %) reduction in the rate of VAP after implementation of VAP care bundle in the two studied groups, which had no significant difference in the associated co-morbidities. This agrees with Resar et al. [20] who found a reduction rate of 44.5%. However Jaffar and Mahmoud [21] showed 80% reduction in VAP rate after controlling of the confounding factors.

The current study revealed that oral colonization was an important risk factor in the development of VAP. This agrees with Ewig et al. [22] who stated that oropharyngeal colonization was a powerful independent predictor of subsequent tracheobronchial colonization (odds ratio 23.9, 95% CI 3.8- 153.3).

The compliance to care bundle element:
Regarding head of bed elevation in this study, it showed a significant improvement from 60% to 80% after implementation of care bundle. This agrees with Alexiou et al. [23] who showed significant improvement in HOB elevation, from 51% before the education sessions to 69%, that significantly lowered the incidence of the clinically diagnosed VAP compared with the supine position. This disagrees with Barbra et al. [24] who showed that it is uncertain whether head of bed elevation is effective or harmful as regards the occurrence of the clinically suspected, and microbiologically confirmed, VAP.

In this study, hand washing showed a significant improvement in practice from 12% to 28% after implementing of VAP care bundle protocol and education with special emphasis on alcohol hand rub usage. This agrees with CDC [1] that strongly recommends to decontaminate hands with soap and water (if hands are visibly soiled) or with an alcohol-based hand rub before and after performing any procedure or handling the fluid in the breathing circuits, humidifiers and heat moisture exchangers. Barrera et al. [25] found that improved hand hygiene, measured by increased alcohol-based hand rub consumption, did not result in a significant reduction in VAP.

In this study oral care with chlorhexidine showed a highly significant improvement in practice from 28% to 76% after implementation of VAP care. This finding was associated significantly with decrease in colonization density from 80% heavy colonized in group 1 to 40% in group 2. This agrees with Chan and Ruest [26] who stated that oral decontamination with antiseptics such as chlorhexidine was associated with a lower risk of heavy colonization with subsequent decrease of VAP rate in mechanically ventilated patients.

Peptic Ulcer Disease (PUD) and Deep Venous Thrombosis (DVT) prophylaxis in this study showed improvement in

practice from 24% to 60%, and 40% to 52% respectively but only PUD showed significant improvement. Although PUD and DVT are included within the ventilator bundle, this is not a specific strategy for VAP prevention. PUD was included in the ventilator bundle as a strategy to prevent stress related mucosal disease, however DVT was included in the ventilator bundle as sedated ventilated patients are at significant risk for thrombosis.

Regarding sedation vacation in this study, it showed improvement in practice from 28% to 40% after implementation of VAP care bundle protocol but this was not statistically significant, Dries et al. [27] stated that daily sedation interruptions reduced ICU length of stay, duration of mechanical ventilation, and the incidence of complications.

As regarding subglottic secretion suctioning in the present study, there was a significant improvement in the practice after education session from 40% to 80% after implementation of VAP care bundle protocol. This agrees with the meta-analysis study conducted by Dezfulian et al.[28] on 896 subjects and found that endotracheal devices incorporating subglottic secretion drainage resulted in reduced rates of early-onset VAP. However Bouza et al. [12] in a large study on 740 subjects found that use of an endotracheal tube that provides continuous suctioning of subglottic secretions did not reduce the incidence of VAP, length of stay, or mortality.

As regard the types of bacterial species isolated by endotracheal aspirates, it can be noted that the most frequent isolated microorganisms were Gram negative bacteria including klebsiella pneumonia, pseudomonas aeruginosa and acinetobacter species. This agrees with Deven et al. [17] as they identified the same isolates as the most frequently isolated organisms from patients with VAP.

In this study the mortality rate decreased significantly by 24% after implementation of VAP care bundle, however VAP attributable mortality is difficult to quantify because of confounding effects of associated conditions which have been estimated to increase mortality by 30% and even twofold in critically ill patients [29].

Conclusion
• Implementation of VAP care bundle had reduced the VAP rate among the studied patients with significant improvement of head of bed elevation, hand washing, oral care, PUD prophylaxis and removal of subglottic secretions.
• The corner stone element of VAP care bundle was the hand hygiene which was a simple, cheap method that was affected by constructive issues and defective supplies.
• Further studies on a large sample size may be needed to detect the improvement of VAP rate per each element.
• Intensive educational programs as regards implementation of VAP care bundle should be established in all types of ICU especially Geriatric ICU.

References

1- Centers for Disease Control and Prevention (CDC). Guidelines for preventing healthcare associated pneumonia: Recommendations of CDC and the Health care Infection Control Practices Advisory Committee. MMWR 2004; 53 (RR-3):1-36.

2- Augustyn RN. Ventilator-associated pneumonia risk factors and prevention. Critical care nurse 2007; 27: 32-39.

3- Kunis KA and Puntillo KA. Ventilator-associated pneumonia in the ICU: Its pathophysiology, risk factors, and prevention. Am J Nurse 2003; 133 (8):64AA-64GG.

4- Kollef MH. Prevention of hospital-associated pneumonia and ventilator-associated pneumonia. Crit Care Med 2004; 32: 1396-1405.

5- American Association of Critical-Care Nurses. Ventilator-associated pneumonia. Available at: http://www.aacn. org/AACN/practiceAlert.nsf/Files/VAPPDF/$FILE/VentilatorAssociatedPneumonia.pdf.Accessed October 11,2006.

6- Blamoun J, Alfakir M, Rella ME, et al. Efficacy of an expanded ventilator bundle for the reduction of ventilator-associated pneumonia in the medical intensive care unit. Am J Infect Control 2008;37(2):172-5.

7- Surawut P, Anak I, Pojana S, Komkham P et al. Oral colonization of Candida species in perinatally HIV-infected children in northern Thailand, Journal of Oral Science 2004; 46(2): 101-105.

8- Richard B and Thomoso JR (2007): Specimen collection, Transport and Processing: Bacteriology. In Manual of clinical microbiology. Murray P; Jorgensen J; Baron E. et al. Chapter (20). Page: 307.

9- Joseph N, Sistal S, Dutta T et al. Role of semi quantitative and quantitative cultures of endotracheal aspirates in the diagnosis of ventilator associated pneumonia. Australian Medical Journal 2010; 3(10): 627-632.

10- Institute for Healthcare Improvement. Prevent ventilator-associated pneumonia. Updated how-to guide. http://www.ihi. org/IHI/Programs/Campaign/VAP.htm. Accessed November, 2010.

11- Arabi Y, Al-Shirawi N, Memish Z et al. Ventilator-associated pneumonia in adults in developing countries: a systematic review. Int J Infect Dis 2008; 12:505 12.

12- Bouza E, Perez M, Munoz P et al. Continuous aspiration of subglottic secretions in the prevention of ventilator-associated pneumonia in the postoperative period of major heart surgery. Chest 2008; 134(5):938-946.

13- Juneja D, Singh O, Javeri Y. Prevention and management of ventilator associated pneumonia: A survey on current practices in the Indian subcontinent. Indian J Anaesth 2011; 55:122-8.

14- National Nosocomial Infections Surveillance. National Center for Infectious Diseases, CDC Public Health Service, US Department of Health and Human Services, Atlanta, GA, Am J Infect Control 2002; 30(8):458-75.

15- Erdem I, Ozgultekin A, Inan AS, et al. Incidence, Etiology and Resistance Patterns of Gram-Negative Microorganisms Isolated From Patients with Ventilator-Associated Pneumonia in a Medical-Surgical Intensive Care Unit of teaching hospital. Jpn. J Infect Dis 2008; 61,339-342.

16- Edwards JR, Peterson KD, Andrus ML, et al. National Healthcare Safety Network, (NHSN) report, data summary for 2006, issued June 2007. Am J Infect Control 2007; 35: 290-301.

17- Deven J, Omender S, Yash J et al. Prevention and management of Ventilator-Associated Pneumonia: A survey on current practices by intensivists practicing in the Indian subcontinent: Indian journal of Anaesth 2011; 55:122-8

18- Awad A. Prevalence of Typical Versus Atypical Lower Respiratory Tract Infection. Unpublished Master Thesis. Faculty of Medicine. Cairo University,2003.

19- Beers M and Berkow R. Chronic Obstructive Airway Disorders. In Merck Manual of Diagnosis and Therapy. 17th ed. Beers, M and Berkow, R.(Eds). Merck Research Laboratories: 2003;P 87-95.

20- Resar R, Pronovost P, Haraden C et al. Using a bundle approach to improve ventilator care processes and reduce ventilator-associated pneumonia. Jt Comm J Qual Patient Saf 2005; 31:243-8.

21- Jaffar AA and Mahmoud SA. Decreasing ventilator-associated pneumonia in adult intensive care units using the Institute for Healthcare Improvement bundle Am J Infect Control 2010; 38:552-6.

22- Ewig S, Torres A, El-Ebiary M, et al. Bacterial colonization patterns in mechanically ventilated patients with traumatic and medical head injury. Incidence, risk factors, and association with ventilator-associated pneumonia. Am J Respir Crit Care Med 1999; 159(1):188-198.

23- Alexiou VG, Ierodiakonou V, Dimopoulos G, et al. Impact of patient position on the incidence of ventilator-associated pneumonia: a meta analysis of randomized controlled trials. J Crit Care 2009; 24:515-522.

24- Barbara SN, Petra G and Axel K. An evidence-based recommendation on bed head elevation for mechanically ventilated patients for the Bed Head Elevation Study Group: critical Care 2011; 15:R111.

25- Barrera L, Zingg W, Mendez F, et al. Effectiveness of a hand hygiene promotion strategy using alcohol-based hand rub in 6 intensive care units in Colombia. Am J Infect Control 2011; 39(8):633-9.

26- Chan EY, Ruest A, Meade MO and Cook DJ. Oral decontamination for prevention of pneumonia in mechanically ventilated adults: systematic review and meta analysis. BMJ 2007; 334:889.

27- Dries DJ, McGonigal MD, Malian MS, et al. Protocol-driven ventilator weaning reduces use of mechanical ventilation, rate of early reintubation, and ventilator-associated pneumonia. J Trauma 2004; 56:943-951.

28- Dezfulian C, Shojania K and Collard H. Subglottic secretion drainage for preventing ventilator-associated pneumonia: a meta-analysis. Am J Med 2005;118:11-18.

29- Rea-Neto A, Youssef NCM, TuheRea-NetoA et al. Diagnosis of ventilator-associated pneumonia: a systematic review of the literature. Critical Care 2008; 12 R56: (doi:10.1186/ cc6877).

Neurofibromatosis type I with astrocytoma: Case Report

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ABSTRACT

Neurofibromatosis type I (NF-1) is an inherited (autosomal dominant) disease caused by mutation of the neurofibromatosis gene. The neurofibromatosis gene is located at chromosome 17q11.2. It is a multi-system, neurocutaneous disorder that predisposes to the development of benign and malignant tumors. We report a case of NF-1 in a 10 year old Libyan female born to non-consanguineous parents, who presented with cafe au lait spots, plexiform neurofibromas, axillary freckles, and intracranial astrocytoma.

Key words: Neurofibromatosis type I, neurocutaneous disorder, cafe au lait spots, intracranial astrocytoma.

Introduction

Neurofibromatosis (NF) is an autosomal dominant disorder, probably of neural crest origin, that affects all 3 germinal layers; therefore, it can involve any organ system, a multisystem genetic disorder that commonly is associated with cutaneous, neurologic, and orthopedic manifestations. It is the most frequent of the so-called hamartoses.

NF type 1 is the most common in humans. Caused by a germ-line-inactivating mutation in the NF1 gene(1) on chromosome 17 it is differentiated from central NF or NF 2 in which patients demonstrate a relative paucity of cutaneous findings but have a high incidence of meningiomas and acoustic neuromas (frequently bilateral).

It is a multisystem disease but it is unlikely that patients will develop all the symptoms of this disease.

Cutaneous findings: café au lait spots (multiple, painless, coffee-colored patches on the skin). They affect 95% of people with NF1. The spots can be present at birth or they can develop by the time a child is three years old. During childhood, most children with NF1 will have at least six café au lait spots, which are around 5mm across. They will then grow to about 15mm during adulthood. Another common symptom is clusters of freckles in unusual places, such as the armpits, groin and under the breast. Neurofibromas (multiple, non-cancerous tumors that develop on the surface of nerve tissue underneath the skin), are usually small during childhood and get larger as a person gets older.

Ocular findings: Optic pathway glioma (OPG), choroid hamartomas, retinal tumors, plexiform neurofibromas of the eyelid, and tiny brown spots in the iris; known as Lisch nodules (2).

Other clinical manifestations are abnormalities of the cardiovascular (3), gastrointestinal, renal, and endocrine systems, facial and body disfigurement, cognitive deficit, and malignancies of the peripheral nerve sheaths and central nervous system (4).

If two or more of the features listed are present, the patients are diagnosed to have NF1.

Management of NF1 (6) involves: regular monitoring to assess the pattern of the symptoms and how the condition is progressing, treating any symptoms when they arise. Surgical

National Institute of Health (NIH) Diagnostic Criteria for Neurofibromatosis type 1(5)
1. **Six or more café au lait macules over 5 mm in greatest diameter in prepubertal individuals and over 15 mm in greatest diameter in postpubertal individuals**
2. **Two or more neurofibromas of any type or one plexiform neurofibroma**
3. **Freckling in the axillary or inguinal regions (Crowe's sign)**
4. **Optic glioma**
5. **Two or more Lisch nodules (iris hamartomas)**
6. **A distinctive osseous lesion such as sphenoid dysplasia or thinning of long bone cortex with or without pseudoarthrosis**
7. **A first-degree relative (parent, sibling, or offspring) with NF1 by the above criteria**

removal of Neurofibromas if it causes pain or other problems, also for cosmetic purposes. Other management includes physical therapy (for muscles hypotonia), supportive devices (7) for any bone deformities, and individualized education plan (8) for those having developmental delay.

Case Report

Figure 1: Abdominal café au lait spots

A 10 year old female, a product of full term normal delivery, her birth weight was 3.3 kg, born to non-consanguineous parents presented to our clinic in Benghazi Medical Center (Libya) as case of NF1 with multiple (>10 in number, >= 1cm in diameter), painless café au lait spots (distributed on her abdomen, chest, back, and her thighs) and axillary freckling (see Figure 1), no family history of NF1, she had five sisters and five brothers without any sign of NF1; her parents noted skin discoloration two weeks after her birth. Her developmental growth was within normal range.

We noted that she also had multiple plexiform neurofibromas (4 in number) on her abdomen and back.

Her ocular examination revealed a normal vision (20/20 in both eyes) without correction, no Lisch nodules and mild temporal pallor of both optic discs. She was investigated thoroughly; brain and orbits MRI showed intracranial astrocytoma (see Figure 2 - opposite page), spine x-ray showed mild cervico-thoracal scoliosis (see Figure 3 - opposite page).

Other investigations were normal including abdominal US / CT scan, and laboratory tests.

Discussion

NF1, also known as von Recklinghausen disease after the researcher Friedrich Daniel von Recklinghausen who first documented the disorder, is an autosomal dominant hamartomatous disease primarily involving the neuroectodermal and mesodermal tissues(9). Although the clinical manifestations of NF1 are well known, the course of the condition in individual patients is largely unpredictable.

In our case we report most common signs and symptoms of NF1 which includes the following: multiple café au lait spots, plexiform neurofibromas, axillary freckles, and intracranial astrocytoma. Many studies done on patients with NF1 have results similar to ours, others have unusual presentation.

One of these studies was done by Maria who reported unusual presentation of neurofibromas on the nipple-areolar complexes (10); were flattened or pedunculated skin lesions that protrude from the nipple-areolar regions and eventually deformed the nipples. There are only a few case reports with coexistence of NFI and vitiligo (11), which may be explained by that chromosome 17 has been linked to both NFI and Vitiligo, so genetic association could be present. Unusual presentation of Facial Plexiform Neurofibromatosis in a 16 year-old female from Eastern Nigeria reported by John (12).

Association of NF-1 with a rare adenocarcinoma of the ampulla of Vater was reported by Renato in a 54-year-old white woman affected by NF-1 who presented with a 2-week history of jaundice (13).

From these studies on patients with NF1, we noted that there were common presentation symptoms and signs of this disease (as in our case report), others have unusual presentations/ associations between them; but all of them should be regularly monitored to assess the pattern of the symptoms, treating any symptoms when they arise.
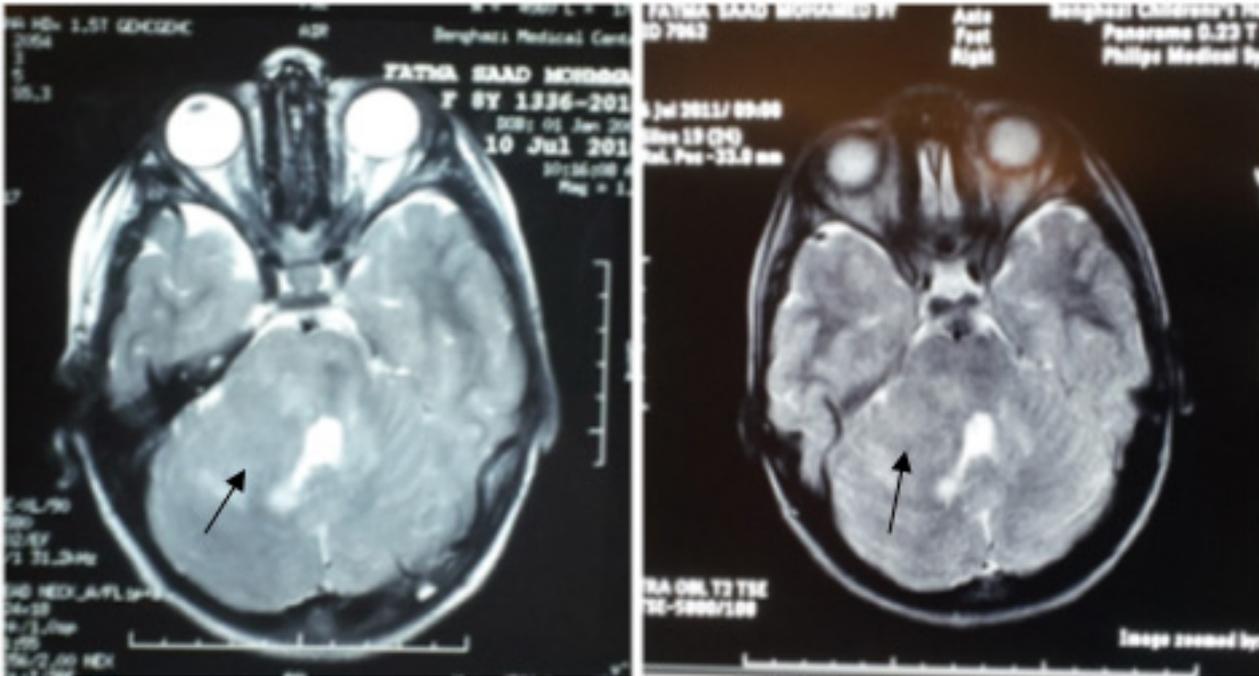
Figure 2: Intracranial astrocytoma

Figure 3: Cervico-thoracal scoliosis

Conclusion

We conclude from our study and other studies done on patients having NF1 that all patients should be monitored regularly (early diagnosis and treatment) to prevent the complications of this disease and to improve the quality and duration of life by treating any symptoms when they arise.

Consent:
Written informed consent was obtained from the parents for publication of this case report and any accompanying images. Copies of the written consent are available.

References
1- Viskochil D. Genetics of neuro?bromatosis 1 and the NF1 gene. J Child Neurol. 2002;17(8):562-570; discussion 571-572, 646 - 651.
2- Lal G, Leavitt JA, Lindor NM, Mahr MA. Unilateral Lisch Nodules in the Absence of Other Features of Neurofibromatosis1. Am J Ophtalmol 2003;135:567-8.
3- Friedman JM, Arbiser J, Epstein JA, et al. Cardiovascular disease in neurofibromatosis 1: report of the NF1 Cardiovascular Task Force. Genet Med. 2002; 4: 105-111.
4- Evans DG, Baser ME, McGaughran J, Sharif S, Howard E, Moran A. Malignant peripheral nerve sheath tumours in neurofibromatosis 1. J Med Genet. 2002;39:311-4.
5- DeBella K, Szudek J, Friedman JM. Use of the national institutes of health criteria for diagnosis of neuro?bromatosis 1 in children. Pediatrics 2000;105:608-14.
6- Gutmann, D. H.; Aylsworth, A.; Carey, J. C.; et al. The diagnostic evaluation and multidisciplinary management of neurofibromatosis 1 and neurofibromatosis 2. JAMA, 278:51-7, 1997.
7- Barton B., & North K. Social skills of children with neurofibromatosis type 1. Dev Med Child Neurol 46, 553-563.(2004).
8- Rowbotham I., Pit-ten Cate I.M., Sonuga-Barke E.J.S., et al. Cognitive control in adolescents with Neurofibromatosis Type 1. Neuropsychology, 23, 50-60. (2009)
9- Haslam RHA. Neurocutaneous Syndromes. In: Kliegman RM, Behrman RE, Jenson HB, Stanton BF, eds. Nelson Textbook of Pediatrics. 18th ed. Philadelphia, Pa: Saunders Elsevier; 2007: chap 596.
10- Maria R Bongiorno*, Spyridoula Doukaki , Mario Aricò. Neurofibromatosis of the nipple-areolar area: a case series. Journal of Medical Case Reports 2010, 4:22.

11- Parimalam K, Athilakshmi S, Nithya D, Manoharan K, et al. Neurofibromatosis type I with vitiligo universalis - A case report e-Journal of the Indian Society of Teledermatology, 2010;Vol 4, No.2

12- John E Arute, Paul JC Nwosu, Patrick O Erah. Facial Plexiform Neurofibromatosis in a 16 Year-Old Female from Eastern Nigeria: A Rare Presentation. International Journal of Health Research, September 2008; 1(3): 105-110.

13- Renato Costi, Pietro Caruana , Leopoldo Sarli, et al. Ampullary Adenocarcinoma in Neurofibromatosis Type 1. Case Report and Literature Review. Mod Pathol 2001;14(11):1169-1174