Risk Factors Associated With Hip Fractures among Adult People in Babylon City, Iraq

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Abstract

BACKGROUND: The fractures of hip joint considered as a serious problem in public health in the medical and socioeconomic issues, the incidence of the fracture neck femur is significantly increased with the increment of general population life span.

AIM: The goal of this study is to highlight and focus on the most important risk factor for the hip fractures in our Babylon society, and to improve our understanding of the medical and social aspects of these predisposing factors.

PATIENTS AND METHODS: A case-control study of older adults (above 60 years old). The study was done on tow samples. First, one consisting of 75 cases those having fracture neck femur considered as cases, and second sample as a control group, consisting of 150 people as a healthy control group having no fracture. A pre-tested questionnaire was prepared to collect data from both samples; the questionnaire included demographic data and information about potential risk factors of hip fracture.

RESULTS: Most of the people in the study samples in both groups were, married women, housekeepers, illiterate and from urban dwellers. There was highly significant association between case-control groups regarding, Continuous using of medication such as cortisone which was found to be a potential risk factor of hip fracture (Unadjusted OR = 3.636), low income was positively associated risk factor of hip fracture in this study (OR = 2.377), low milk intake, low sun exposure, tobacco smoking were positively associated with this health problem (OR = 1.794), while physical exercise was protective factor (OR = 0.489).

CONCLUSION: The highest risk factors associated with increased occurrence of hip fracture were using cortisone, Osteoporosis, tobacco smoking, consuming soft drinks, and less exposure to sunlight.

Introduction

The fractures of hip joint considered as a serious problem in public health in the issues of morbidity, treatment cost, long inpatient stay, social impact and mortality. With the significant improvement in medical services and increasing the general population life span, the incidence of the fracture neck femur is significantly increased as well, due to osteoporosis. It accounts for over 40% of the estimated burden of osteoporosis worldwide [1].

Among adults, 65 years of age and older, the hip fracture cause more than 340,000 hospitalisations per year. The older adults especially the women who have fragile bone due to osteoporosis have a high incidence of hip fracture as they tend to have frequent falls, as they usually have many comorbidities beside the general frailty due to age and week quadriceps muscles, the effects of medications for the transient ischemic arracks, anaemia, and heart diseases. Mortality rates post-hip fracture range between 12% and 32% per year [1], [2].

It is about 90% of all hip fracture occur in people older than 50 years. The incidence is doubling for each subsequent decade after the age of 50; it is 2-3 times higher in women than in men. And with the expansion of the old age group population, the number of hip fractures can also be expected to increase, even if the age-related incidence of hip

fracture remains unchanged [3].

In the United States, it is about one third only of the hip fractures occurring in men. While two thirds in females, as the males do not experience a precipitous decrease in endogenous sex hormones analogous to menopause. And usually, they have a shorter life span. The rates of females affection were stable in the US, but from (2000 to 2009) showed a declined [4].

Although it is only 30% of all hip fracture, occur in men, but the loss of independence after a hip fracture and the morbidity, mortality, is greater in men than women [4], [5].

Hip fractures still considered one of the most serious health care problems, in spite of much researchers concern. And in spite of some evidence of real declining in the prevalence rate of hip fractures, it is still considered as a persistent cause of excessive morbidity, unsatisfied life quality and early mortality among older adults. And because of the management protocols are not universally applied worldwide, it is expected to see an increased, rather than decreased annual incidence of hip fracture over the next few decades [6]. As it is known, there are intracapsular and extracapsular fractures; the AVN is the most dangerous complication of the intracapsular fractures [2].

Many risk factors need to be monitored and to take the appropriate action to treat, so we can prevent the osteoporosis and then decrease the prevalence rate of hip fractures.

Besides the age and osteoporosis, other possible risk factors may be the following: (cigarette smoking, lack of physical activity, medications that cause osteoporosis, disturbed mentality, consumption of excessive alcohol and caffeine, low body weight with tall stature, vision problems, generalised weakness, disability, or unsteady gait that increased risk for falls.) [7].

Importance of the study

Many risk factors are associated with hip fractures; maybe the age is the most important one. In the last few decades, some geographic variations noticed in the incidence among the elderly in different regions of the world. In recent systematic review concluded that the rate of hip fractures might be lower in Asian, but it is increasing with the time. This variation in incidence may be related to some etiological and environmental factors. In Taiwan, for example, the hip fractures are considered a serious medical and geriatric economic issue. Except for Japan, there are few studies about hip fractures in Asia. For that reason, there is a real need for epidemiological studies in Asia to assess the potential changes in the expected risk factors of hip fractures, to help the health administration authorities to put the

proper plans and policies for the future care of those populations. It is important to know about the long term medical outcomes and how to prevent the second occurrence of hip fractures among older adults in Asia countries [8], [9], [10]. In the developed world countries, with the improvement in medical care and increased life expectancy, the hip fractures become a serious public medical problem, as the elderlies are liable for frequent falls due to generalised muscle weakness and many types of walking disabilities.

Although most of the older adults are osteoporotic but that is alone does not result in hip fracture without sustaining a trauma, so if we plan to decrease the rate of incidence of hip fractures we need to study the two aspects of the problem, the medical and social aspects of the problem for any policy of the hip fracture prevention to be successful [9], [10], [11], [12].

The goal of this study is to highlight and focus on the most important risk factor for the hip fractures in our Babylon society, and to improve our understanding of the medical and social aspects of these predisposing factor, so we can help the medical health authority to put the proper plan to prevent and treat older adults those vulnerable to sustain hip fractures.

Patient and Method

This is a case-control study. The sample was selected purposively (non-probability) of age group 60 years and above (Elderly), 75 cases of patients with hip fracture were taken and compared with 150 cases of a healthy control group without hip fracture. The study was conducted in (Babylon province/Iraq) from 21 July 2018 to 18 February 2019.
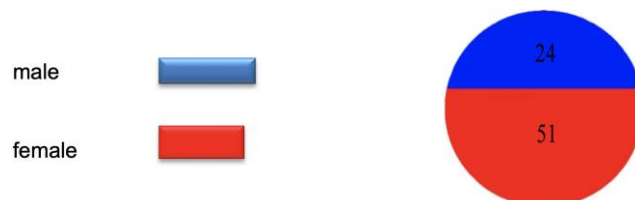
Figure 1: frequency distribution of old adult patients with hip fracture

Method of data collection: A questionnaire was used to collect data through the interview the participant in this study.

The questionnaire included a socio demographical characteristics of the patient like (age, gender, level of education, place of residence, occupation, smoking, exercises, family monthly income), any previous disease such as (DM, Hypertension, Arthritis, asthma and other chronic

disease, as well as any history of drug intake. And information about the fracture; the type of accident that leads to hip fracture, family history of hip fracture, did he do serum vitamin D test and its value (sufficient or nonsufficient).

Data analysis

The data were analysed using the statistical package of socio science program 24 (SPSS). Data were presented in tables, and graphs value less than 0.05 considers statistical significant in this study. The chi-square test was used to measure the associations between different variables. Odds ratio (OR) was collected to measure the risk of exposure.

Results

From Table 1, we can see that most of the population was older 70 – 79 age group 37.3%, and most of them were female 68%, most of them were currently married 52%, majority of them live at urban regions 64.3%, most of them the females are housewives 38.7%, economic status of most of them was not enough 68%, those with enough and more only 5.3%.

Table 1: Frequency distribution of participants with hip fractures (cases) by demographical data

Item	Frequency	Percentage
Age		
50 – 59	15	20%
60 – 69	18	24%
70 – 79	28	37.3%
80 – and higher	14	18.7%
Total	75	100%
Gender		
Male	24	32%
Female	51	68%
Total	75	100%
Marital status		
Currently Married	39	52%
Widowed	31	41,3%
Divorced	5	6.7%
Single	0	0
Total	75	100%
Address		
Urban	48	64.3%
Rural	27	36.7%
Total	75	100%
Educational level		
Cannot read and write	12	16%
Read and write	25	33.3%
Middle school	15	20%
Secondary school	11	14.7%
College and higher	9	12%
Total	75	100%
Occupation		
Housewife	29	38.7%
Have no work	17	22.7%
Retired	11	14.6%
Employee	13	17.3%
Military field	5	6.7%
Total	75	100%
Economic status		
Not enough	51	68%
Enough	20	26.7%
Enough and more	4	5.3%
Total	75	100%

From Table 2 we may notice that most of the population doesn't practice exercise 84%, most of them were not smokers 61.3%, and the reason of fractures in most of them was fall out 64%.

Table 2: Distribution of patients with hip fracture according to possible risk factors and health-related variables

Item	Frequency	Percentage
Do you practice exercise?		
Yes	12	16%
No	63	84%
Total	75	100.%
Smoking		
Smoker	29	38.7%
Not smoker	46	61.3%
Total	75	100%
Type of smoking		
Cigarette	22	75.9%
Bubble	7	24.1%
Others	0	0%
Total	29	100%
Reason of fracture		
Fall out	48	64%
Another reason	27	36%
Total	75	100%
Another current disease		
DM	20	26.7%
Hypertension	27	36%
Rheumatism	16	21.3
Osteoporosis	9	12
Others	3	4
Total	75	100%
Period stayed in the hospital		
Did not admitted	50	66.7%
Short period (1 - 5) days	16	21.3%
Middle period (6 –14) days	6	8%
Long-period 15 days &more	3	4%
Total	75	100%
Complication		
Presence	44	58.7%
Absent	31	41.3%
Total	75	100%
Presence of similar cases in the family		
Present	32	42.6%
Absent	43	57.3
Total	75	100%
Is any person take care of the patient?		
Yes	59	78.7%
No	16	21.3%
Total	75	100%
Have you ever attended a seminar on prevention of pelvic bones fracture or falls?		
Yes	6	8%
No	69	92%
Total	75	100%
Have you ever had a previous downfall?		
Yes	10	13.3%
No	65	86.7%
Total	75	100%
Take medication		
Yes	59	78.7%
No	16	21.3%
Total	75	100%
Type of medication		
Cortisone	20	33.8
Analgesic	8	13.6
DM drugs	16	21.3
Hypertension drugs	12	20.3
Others	3	5.1
Total	59	100%
Ingest milk and milk products daily		
Yes	27	36%
No	48	64%
Total	75	100%
Amount per day		
Little	14	51.8%
Medium	9	33.3%
Abundant	4	14.8%
Total	27	100%
Drink soft drinks more than twice a week		
Yes	48	64%
No	27	36%
Total	75	100%
Exposed to direct sunlight		
Yes	28	37.3%
No	47	62.7%
Total	75	100%
Period of exposed		
Continuously	5	17.8%
Weekly	13	46.4%
Sometimes	10	35%
Total	28	100%
Have you ever tested the vitamin D level?		
Yes	22	29.3%
No	53	70.7%
Total	75	100%
If yes, What are the results were?		
Low level	15	68.1%
Normal	7	31.8%
Total	22	100%

Hypertension was another current disease in 36% of them, 58.7% of them have got certain complications, family history was negative for having such fracture in 57.3%, and 78.7% have a person take care of the patient, 92% have not attended a seminar about prevention of pelvic bone fractures or how to

avoid falls, 78.7% currently taking medications, in 33.8% it was cortisone, 36% ingesting milk and milk products daily and 51.8% of them ingesting only little amounts per day, 37.3% have exposed to direct sunlight, 70.7% have never tested vitamin D level.

Table 3: Distribution of the study group according to demographic characteristics

Item	Cases	Controls
Age(year)	No. (%)	No. (%)
50 – 59	15 (20)	28 (18.7)
60 – 69	18 (24)	56 (37.3)
70 – 79	28 (37.3)	45 (30)
80 – and higher	14 (18.7)	21 (14)
Total	75 (100%)	150 (100%)
Gender		
Male	24 (32)	61 (40.7)
Female	51 (68)	89 (59.3)
Total	75 (100%)	150 (100%)
Marital status		
Currently Married	39 (52)	87 (58)
Widowed	31 (41.3)	59 (39.3)
Divorced	5 (6.7)	4 (2.7)
Single	0 (0)	0 (0)
Total	75 (100%)	150 (100%)
Place of residence		
Urban	48 (64)	98 (65.3)
Rural	27 (36)	52 (34.7)
Total	75 (100)	150 (100%)
Educational level		
Cannot read and write	12 (16)	18 (12)
Read and write	25 (33.3)	67 (44.7)
Middle school	15 (20)	35 (23.3)
Secondary school	11 (14.7)	20 (13.3)
College and higher	9 (12)	10 (6.7)
Total	75 (100%)	150 (100%)
Occupation		
Housewife	29 (38.7)	74 (49.3)
Have no work	17 (22.7)	37 (24.7)
Retired	11 (14.6)	12 (8)
Employee	13 (17.3)	16 (10.7)
Military field	5 (6.7)	11 (7.3)
Total	75 (100%)	150 (100%)
Economic status		
Not enough	51 (68)	43 (28.6)
Enough	20 (26.7)	82 (54.7)
Enough and more	4 (5.3)	25 (16.7)
Total	75 (100%)	150 (100%)

From Table 3 for those of (case group), indicated that most of the population were elderly(70 – 79 years) age group 37.3%, and most of them were female 68%, most of them were currently married 52%, majority of them live at urban regions 64%, most of them are housewives 38.7%, regarding the economic status most of them with(not enough) 68%.

While in the other Table of (control group) indicated that most of the population were ranging from(60 – 69 years) age group 37.3%, and also most of them were female 59.3%, most of them are currently married 58%, majority of them live at urban regions 65.3%, higher percentage of them are educated, at least they are reading and writing 44.7%, most of them were housewives 49.3%, economic status was enough in most of them 54.7% and those (not enough) only 28.6%.

From Table 4 if we look for the (case group), we may see, that most of the patients don't practice exercise 84%, most of them were not smokers 61.3%, and the smoker group of them (38.7%), those were using cigarette 75.9%, the reason of fractures was fall out in 64%. Hypertension was in 36% of them as another current disease, 58.7% present with complications, 57.3% have negative family history of hip fracture, 78.7% have a person takes care of the patient, 92% have not attended a seminar on

prevention of pelvic bone fracture or fall prevention, 78.7% taking medication, in 33.8% it was cortisone, 36% ingest milk and milk products daily, and 51.8% were ingesting a little amounts per day, 37.3% have exposed to direct sunlight, 70.7% have not tested vitamin D level.

Table 4: Odds ratio of fracture hip among the (study group)

Item	cases	controls
Do you practice exercise?		
Yes	12 (16)	67 (44.7)
No	63 (84)	83 (55.3)
Total	75 (100%)	150 (100%)
Smoking		
Smoker	29 (38.7)	39 (26)
Not smoker	46 (61.3)	111 (74)
Total	75 100%	150 (100%)
Type of smoking		
Cigarette	22 (75.9)	24 (61.5)
Bubble	7 (24.1)	15 (38.5)
Others	0 (0)	0 (0)
Total	29 (100%)	39 (100%)
Reason of fracture		
Fall out	48 (64)	
Another reason	27 (36)	
Total	75 (100%)	
Another current disease		
DM	20 (26.7)	48 (32)
Hypertension	27 (36)	39 (26)
Rheumatism	16 (21.3)	11 (7.3)
Osteoporosis	9 (12)	5 (3.3)
Others	3 (4)	47 (31.3)
Total	75 (100%)	150 (100%)
Period stayed in the hospital		
Did not admitted	50 (66.7)	
Short period (1-5) days	16 (21.3)	
Middle period (6-14) days	6 (8)	
Long-period 15 days more	3 (4)	
Total	75 100%	
Complication		
Presence	44 (58.7)	
Absent	31 (41.3)	
Total	75 (100%)	
Presence of similar cases in the family		
Present	32 (42.7)	37 (24.7)
Absent	43 (57.3)	113 (75.3)
Total	75 (100%)	150 (100%)
Is any person take care of the patient?		
Yes	59 (78.7)	128 (85.3)
No	16 (21.3)	22 (14.7)
Total	75 (100%)	150 (100%)
Have you ever attended a seminar on prevention of pelvic bone fracture or falls?		
Yes	6 (8)	15 (10)
No	69 (92)	135 (90)
Total	75 (100%)	150 (100%)
Have you ever had a previous downfall?		
Yes	10 (13.3)	11 (7.3)
No	65 (86.7)	139 (92.7)
Total	75 (100%)	150 (100%)
Take medication		
Yes	59 (78.7)	90 (60)
No	16 (21.3)	60 (40)
Total	75 (100%)	150 (100%)
Type of medication		
Cortisone	20 (33.8)	7 (7.8)
Analgesic	8 (13.6)	28 (31.1)
DM drugs	16 (21.3)	24 (26.7)
Hypertension drugs	12 (20.3)	21 (23.3)
Others	3 (5.1)	10 (11.1)
Total	59 (100%)	90 100%
Drinking milk and milk products daily		
Yes	27 (36)	88 (58.7)
No	48 (64)	62 (41.3)
Total	75 (100%)	150 (100%)
Amount per day		
Little	14 (51.8)	25 (28.4)
Medium	9 (33.3)	39 (44.3)
Abundant	4 (14.8)	24 (27.2)
Total	27 (100%)	88 (100%)
Drink soft drinks more than twice a week		
Yes	48 (64)	53 (35.3)
No	27 (36)	97 (64.7)
Total	75 (100%)	150 (100%)
Exposed to direct sunlight		
Yes	28 (37.3)	116 (77.3)
No	47 (62.7)	34 (22.7)
Total	75 100%	150 (100%)
Period of exposed		
Continuously	5 (17.9)	39 (33.6)
Weekly	10 (35.7)	54 (46.6)
Sometimes	13 (46.4)	23 (19.8)
Total	28 100%	116 (100%)
Have you ever tested the vitamin D level?		
Yes	22 (29.3)	37 (24.7)
No	53 (70.7)	113 (75.3)
Total	75 (100%)	150 (100%)
If yes, What are the results were?		
Low	15 (68.1)	9 (24.3)
Normal	7 (31.8)	28 (75.7)
Total	22 (100%)	37 (100%)

While in the other column of Table 4 for the (control group) indicated that most of the population doesn't practice exercise 55.3%, most of them were not smokers 74%, but who are smoking are only (26%), 61.5% of them were using a cigarette. Another current disease was hypertension among 26% of them, 75.3% have negative family history for such fracture, 85.3% have a person take care of the patient, 90% have not attended a seminar on prevention of pelvic bone fracture or fall prevention, 60% are currently taking medication, only in 7.8% was the cortisone, 58.7% are daily ingested milk and milk products.

Table 5: Odds Ratios of hip fractures of exposed cases to different independent variables

Medical conditions as a risk factor of hip fracture	Cases		Controls		Odds ratio
	F	%	F	%	
Hypertension	27	36	39	26	1.384
DM	20	26.7	48	32	0.834
Rheumatism	16	21.3	11	7.3	2.917
Osteoporosis	9	12	5	3.3	3.636
Smoking	29	38.7	39	26	1.488
Don't practice exercise	63	84	83	55.3	1.245
Family income (Not enough)	51	68	43	28.6	2.377
Don't drink milk and products daily	48	64	62	41.3	1.549
Present similar cases in the family	32	42.7	37	24.7	1.728
Type of medication (Cortisone)	20	33.8	7	7.8	4.333
Analgesic	8	13.6	28	31.1	0.437
DM drugs	16	21.3	24	26.7	0.797
Hypertension drugs	12	20.3	21	23.3	0.858
Soft drink more than twice a week	48	64	53	35.3	1.813
Vitamin D (deficiency)	15	68.1	9	24.3	2.802

We may assess the medical conditions as a risk factor of hip fractures among study participants, as seen in Table 5 which shows the medical problems of the study sample which are considered as a risk factor among (case group), the highest percentage of the case sample had family income (not enough) (68%) and the highest percentage of osteoporosis (12), while in control group only (28.6) of them was the level of family income (not enough), and the lowest percentage of having osteoporosis (3.3%) and type of medication (cortisone) was the lowest percentage (7.8%) comparing with 33.8% in the case group.
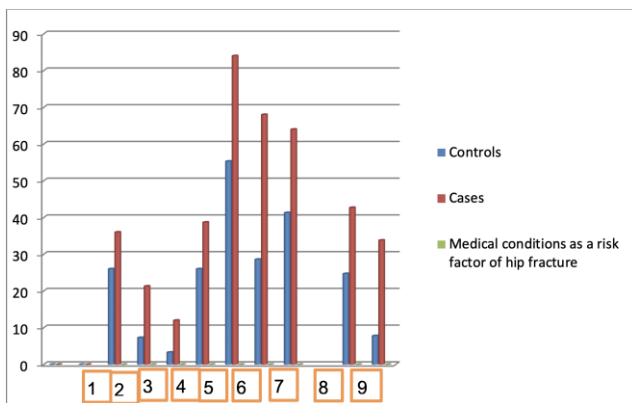

Figure 2: Odds Ratio of risk factors; 1-HRT; 2-Rheumatism; 3-osteoporosis; 4-smoking; 5-lack exercise; 6-income not enough; 7-no milk intake; 8-family history +ve; 9-cortisone intake

The Odds Ratio of different medical problems among study participants in both case and control

groups as associated risk factors, are shown in Figure 2, as following: hypertension (OR = 1.384), DM (OR = 0.834) ,Rheumatism (OR = 2.917), Osteoporosis (OR = 3.636), Smoking (OR = 1.488), Don't practice exercise (OR = 1.245), Family income (Not enough) (OR = 2.377), Don't drinking milk and products daily (OR = 1.549), Present similar case in the family (OR = 1.728), Type of medication (cortison) (OR = 4.333), Anxiolytic (OR = 0.437), Hypertension drugs (OR = 0.858), DM (OR = 0.797), Soft drink more than twice a week (OR = 1.813), vitamin D deficiency (OR = 2.802).

Discussion

There is very little information available about the epidemiology of hip fractures in Iraq, and the most significant risk factors of this disabling fracture. Preventing the occurrence of hip fracture is a public health priority in our society, given the ongoing transition to the super-ageing society. The risk for hip fractures can be reduced by preventing falls. It is therefore important to identify those individuals most at risk of falling to maximise the effectiveness of any proposed public health and family nursing interventions [13].

Regarding the socio-demographic characteristics of the study sample, most of them in both case and control groups were illiterate, married, keeping homemakers, from an urban area.

The results in this study go with the findings of the study which was done by Coutinho et al. Many medical conditions that are considered as a risk factor of hip fracture among elderly adults, most of them have an increased associated risk factor with hip fracture like Osteoporosis, Hypertension and using antihypertensive drugs, ambulation problems like osteoarthritis of knee joints, history of hip fracture, and history of falls respectively [14], [15].

In our study, the results are almost similar to what had been mentioned by Suzuki et al., in Japan, who found that these medical disorders were highly associated with increased risk factors of hip fractures in elderly. And also goes with the findings of other articles like that done by Ribeiro et al., in 2014 in South Brazil, and that of Welfare in 2010, done for Australian Institute of Health [16], [17], [18].

In our study, we studied the pattern of lifestyle of the participants, (Milk and dairy products and its amount per day, sun exposure and how often per week, smoking, and physical exercises). Those who have a little physical exercise (less than four times per week) have increased risk of getting hip fractures. Also, we found the role of currently heavy smoking is a risk factor of hip fracture, and in some studies, they considered the smoking is a greater risk of hip

fracture, whether the patient is ex- or current smoker in comparison to those who do not smoke [14].

In this study, we found that there is a positive association between low income and hip fracture. This finding goes with findings of other researches abroad [19], [20]. Despite the problem of hip fractures considered a great public problem [19], [21], [23], actually a few studies only that have analysed the association between hip fractures and socioeconomic status, so it remains unclear.

Some of the articles found an increased incidence [20], [22], [23], [24], [25], [26], [27] while others found a decreased incidence of Hip fractures with low socioeconomic status [28], [29]. Some articles found an association with only some socioeconomic indicators [30], [33]. In another status, they found an increased risk of hip fractures of some socioeconomic indicators and decreased or no association of other socioeconomic markers [34], [38]. However, we may conclude that although it is an important factor, not all the studies found a direct association between the hip fractures and socioeconomic status [39], [40].

We recommend an educational program should be done to raise the level of awareness among older adults and their families about the preventive measures, to avoid the risk factors of hip fractures, avoidance of miss use of medication, encouraging physical exercise among elders but protecting them from fall.

In summary, osteoporosis, smoking, lack of physical exercise and lack of sunlight exposure, less milk and milk products intake, heavy consumption of soft drinks, were the main risk factors for hip fracture among elderly persons.

Ethical Approval

All the variable information consents of the patients and control groups were taken after explaining the purpose of the study to the patients, Those who refused to participate in the study were excluded. And all are approved according to the ethical standards of our institutional research committee.

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