

Incidence of hip fractures in the Lebanese population

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معدل حدوث كسور عنق الفخذ بين سكان لبنان رفيق بدورة

الخلاصة: تمثل هذه الدراسة أول دراسة استباقية تتناول تقدير معدل حدوث كسور عنق الفخذ بين سكان لبنان. وقد أبلغ جميع جراحي العظام في بيروت عن وجود حالات من كسور عنق الفخذ بين 1 تشرين الأول/أكتوبر و31 كانون الأول/ديسمبر 1996. وتم استيفاء معطيات ترجع إلى عام كامل وتقيسها بالنسبة لجميع السكان. وقد بلغ معدل الحدوث السنوي 0.129% (0.153% بين النساء و0.100% بين الرجال)، مع ملاحظة تزايد هذا المعدل مع التقدم في السن واستمرار زيادته بين النساء عنه بين الرجال. وقد كانت نتائجنا مماثلة لنتائج الدراسات التي أجريت على أعداد أكبر في سائر بلدان شرق المتوسط. ويقع معدل حدوث كسور عنق الفخذ بين سكاننا داخل مدرج الاختطار بين الغرب والشرق، والشمال والجنوب، مما يؤكد أهمية العوامل البيئية والوراثية باعتبارها من عوامل اختطار حدوث الكسور الناجمة عن تخلخل العظام.

ABSTRACT This is the first prospective study to estimate the incidence of hip fractures in the general population in Lebanon. All orthopaedic surgeons in Beirut reported on hip fracture cases between 1 October and 31 December 1996. Data were extrapolated to 1 year and standardized for the whole population. The estimated annual incidence rate was 0.129% (women: 0.153%, men: 0.100%), increasing with age and remaining higher in women. Our figures are comparable with larger studies in other Mediterranean countries. The incidence rate of hip fractures in our population falls within a gradient of risk between the west and the east and the north and the south, highlighting the importance of environmental and genetic factors as risk factors for osteoporotic fractures.

Incidence des fractures de la hanche dans la population libanaise

RESUME Il s'agit de la première étude prospective visant à estimer l'incidence des fractures de la hanche dans la population générale au Liban. Tous les chirurgiens orthopédiques de Beyrouth ont notifié les cas de fracture de la hanche survenus entre le 1^{er} octobre et le 31 décembre 1996. Les données ont été extrapolées sur un an et standardisées pour la population dans son ensemble. Le taux d'incidence annuel estimé s'élevait à 0,129% (femmes : 0,153%, hommes : 0,100%), augmentant avec l'âge et demeurant plus élevé chez la femme. Nos chiffres sont comparables à ceux d'études plus importantes réalisées dans d'autres pays de la Méditerranée orientale. Le taux d'incidence des fractures de la hanche dans notre population se situe dans un gradient de risque entre l'ouest et l'est et le nord et le sud, soulignant l'importance des facteurs environnementaux et génétiques en tant que facteurs de risque des fractures ostéoporotiques.

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Introduction

Fractures are the main osteoporosis outcome measure both for research questions and public health decisions [1]. Worldwide, hip fractures are the most relevant outcome measure of both morbidity and mortality resulting from osteoporosis [2–5] as case ascertainment is less problematic than with fractures at other sites. In the Middle East, one study on the Kuwaiti population has recently been reported [6]. In Lebanon, data on the incidence of hip fractures are so far lacking.

This is the first prospective study to estimate the incidence of hip fractures in the general population in Lebanon.

Methods

All orthopaedic surgeons working in Beirut agreed to collaborate by completing a structured questionnaire on all consecutive hip fracture cases on which they were consulted over a 3-month period from 1 October to 31 December 1996. A double check of case ascertainment was performed by direct contact with the operating theatre units of all Beirut hospitals. Hip fracture was defined radiologically as a fracture trait of the proximal femur that could be sub-capital, in the femoral neck or in the trochanteric and intertrochanteric area.

For each hip fracture case, the form included data on the clinical characteristics of the fracture and risk factors for osteoporosis and fractures. Clinical attributes included age, sex, site of fracture, time and place of fracture and type of accident. Risk factors were personal and family history of fracture, associated chronic morbidity, chronic medication, and for females, age at menarche, age at menopause, history of breastfeeding and number of children.

The population of Beirut was estimated from a national survey performed by the Ministry of Social Affairs in collaboration with the United Nations Development Programme. This figure provided the denominator. In order to correct for the population at risk, the numerator excluded cases referred from outside Beirut.

The data obtained from the 3-month period of follow-up were extrapolated to 1 year and to the whole Lebanese population, so that we could estimate the annual incidence of hip fractures in Lebanon.

Results

A total of 63 hip fracture cases were reported in Beirut during the 3-month period. There were 40 females and 23 males, with a female/male sex ratio of 1.74. Mean age was 70 years (standard deviation = 16, range = 30–92 years), the median was 72 years and the mode 65 years. The observed 3-month incidence rate of hip fractures among individuals over 30 years of age in Beirut was 0.03%; 0.038% in women compared to 0.025% in men (Table 1).

The annual cumulative incidence rate in Lebanon, assuming no large seasonal variation, would be 0.129% giving an expected annual number of 1629 hip fractures for a population of 1 264 884 individuals aged 30 years and above (Table 2). Similarly the annual cumulative incidence rate of hip fractures in women is estimated to be 0.153% compared to 0.101% in men.

Hip fractures were distributed as follows: sub-capital 25.4%, femoral neck 19.0% and intertrochanteric area 55.6%. A fall from standing or sitting was the cause of 90.3% of the fractures and the remaining 9.7% was due to other types of trauma. Of the fractures, 74.2% occurred at home, 22.6% in public areas and for the remaining

Table 1 Estimated 3-month incidence rate (IR) of hip fractures (HF) in the population of Beirut (estimated population size over 30 years = 192 655)

Age group (years)	Men	Women	Total	Men HF	Women HF	Total HF	Men IR %	Women IR %	Total IR %
30-39	24 608	32 172	56 780	1	3	4	0.004	0.009	0.007
40-49	19 366	24 376	43 742	2	1	3	0.010	0.004	0.007
50-59	18 651	20 699	39 350	3	2	5	0.016	0.010	0.013
60-69	15 095	16 868	31 963	6	8	14	0.040	0.047	0.044
70-79	7 839	7 828	15 667	2	11	13	0.026	0.141	0.083
80-89	2 059	2 456	4 515	6	11	17	0.291	0.448	0.377
90-99	297	341	638	2	4	6	0.673	1.173	0.940
Total	87 915	104 740	192 655	22 ^a	40	62 ^a	0.025	0.038	0.032

^aOne male was under the age of 30 years.

3.2% the place was not specified. As regards time of day, 76.3% were reported in daytime compared to 23.7% at night.

Among the risk factors studied, there was a statistically significant association

between hip fracture and previous personal history of vertebral fracture (odds ratio = 5.04, 95% confidence interval: 1.31-28.26). A previous personal history of any fracture almost reached statistical signifi-

Table 2 Age- and sex-adjusted^a annual incidence rate (IR) and expected annual number of hip fractures (HF) in the Lebanese adult population (aged 30 years and over; estimated population size = 1 264 884)

Age group (years)	Men IR %	Women IR %	Total IR %	Expected number of HF in men	Expected number of HF in women	Expected total number of HF
30-39	0.005	0.013	0.010	33	88	121
40-49	0.009	0.004	0.006	56	25	81
50-59	0.012	0.007	0.009	72	45	117
60-69	0.024	0.027	0.026	146	178	324
70-79	0.007	0.038	0.023	45	252	297
80-89	0.032	0.043	0.035	191	282	473
90-99	0.012	0.022	0.017	71	145	216
Total	0.100	0.153	0.129	614	1015	1629

^aStandardized adjustment to age and sex distribution of the general population.

cance (odds ratio = 2.82, 95% confidence interval: 0.97–9.23).

Discussion

This is the first prospective study to assess the incidence of hip fractures in Lebanon. The observed incidence rates are within the range reported from other Mediterranean countries. Age and sex patterns are similar to international and Mediterranean observations. This might not be true for other fracture sites.

The incidence of hip fractures in the Lebanese population over 50 years, estimated at 0.2%, is within the range reported by the MEDOS survey which gave an incidence of 0.1% among men and 0.21% among women [7]. It is lower than the figure of 0.5% reported in urban Portugal and higher than rural Turkey where the estimated incidence is 0.04% [7].

Considering the demographic characteristics of our population, which has a shorter life expectancy than industrialized countries, the lifetime risk of femoral fractures is expected to be lower than in an industrialized country with a similar pattern of risk factors. In Europe [8,9], the incidence of hip fractures among women varies from 0.7% in Norway to 0.1% in the former Yugoslavia. In the United States [10], the incidence of hip fractures among women increases from 0.2% at 65 years to 3% at 85 years. In the South American continent [11], where life expectancy is similar to our population, incidence of hip fractures among women over 50 years is around 0.4% in Argentina and 0.1% in Ven-

ezuela, while in China [12], it varies between 0.01% in the south and 0.07% in the north. The incidence of hip fractures in women over 50 years in Hong Kong is 0.4% [13], while in Japan [14] the incidence of hip fractures among women over 35 years ranges from 0.07% in to Okinawa 0.1% in Tottori.

Overall, the incidence rate of hip fractures in the Lebanese population falls within what looks like a gradient of risk between the west and the east and the north and the south, which highlights the importance of environmental and genetic risk factors [4,15].

In the study, incidence was estimated over a short period of follow-up and assumed no seasonal variations. However, the catchment population could easily be defined, and case collection from hospital operating theatres was reliable. The figures are comparable with larger studies in other Mediterranean countries, most importantly the MEDOS results. The age and sex pattern of hip fracture incidence is also similar, with an exponential increase with age that is more pronounced in women than in men.

In conclusion, this study gives an overall estimate of the expected annual number of hip fractures throughout the country (1629 fractures for a population of 1 264 884 individuals aged 30 years and above). Personal and family histories of fracture are important risk factors and could serve to identify high-risk population subgroups [3]. This could be helpful for decision-making at the level of national health policy.

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