

Changing use of the emergency department by the elderly in the United Arab Emirates, 1989 and 1999

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التغيرات في استفادة المسنين من قسم الطوارئ في الإمارات العربية المتحدة 1989 و1999
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الخلاصة: تمت دراسة التغيرات في استفادة المسنين من قسم الطوارئ في أحد المستشفيات الكبرى في (العين) في عامي 1989 و1999. وقد شملت الدراسة كل المرضى الذين تزيد أعمارهم على 65 عاماً ممن راجعوا غرفة الطوارئ، وهي دراسة استقصائية مستعرضة. وتبين أن عدد المرضى زاد من 321 مريضاً في عام 1989 إلى 1347 مريضاً في عام 1999 دون ملاحظة أي تغير يُعَدُّ به في نسبة الإناث إلى الذكور والتي كانت 0.78، أو في العمر الوسطي للمسنين المستفيدين من غرفة الطوارئ والذي بلغ 72.9 ± 7.4 سنوات. وعلى هذا فقد ارتفع معدل المراجعات بمقدار 5.4 أضعاف بينما ارتفع معدل المراجعات غير الطارئة إلى 14.7 ضعفاً. يدل على ازدياد في معدل الاستفادة إلى جانب انخفاض في وخطامة الأمراض عبر هذه السنوات.

ABSTRACT Changes in use by the elderly of the emergency department of a major hospital in Al-Ain in the years 1989 and 1999 were examined. All patients aged 65 years or older who attended the emergency room were included in this cross-sectional survey. Patient numbers rose from 321 in 1989 to 1347 in 1999 with no significant change in the female to male ratio of 0.78 or the mean age of the elderly attendees 72.9 ± 7.4 years. Attendance rose 5.4 fold while non-urgent attendance rose 14.7 fold, demonstrating rising use but falling illness severity over time.

Evolution de l'utilisation du service des urgences par les personnes âgées aux Emirats arabes unis, 1989 et 1999

RESUME On a examiné les modifications intervenues dans l'utilisation par les personnes âgées du service des urgences d'un grand hôpital à Al-Ain durant les années 1989 et 1999. Tous les patients âgés de 65 ans ou plus qui se sont rendus au service des urgences ont été inclus dans cette enquête transversale. Le nombre des patients est passé de 321 en 1989 à 1347 en 1999, sans changement significatif dans le rapport hommes/femmes qui était de 0,78 ou dans l'âge moyen des personnes âgées se rendant dans ce service, à savoir $72,9 \pm 7,4$ ans. La fréquentation du service des urgences a augmenté de 5,4 fois tandis que la fréquentation des autres services a été multipliée par 14,7, montrant une augmentation de l'utilisation mais une diminution de la sévérité de la maladie au fil du temps.

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Introduction

Although the elderly have a higher rate of health care use than other age groups, there is a low level of awareness of their special needs in the emergency room (ER) reflected by the paucity of research in this area [1-4]. Little information is available concerning the situation in countries that do not have an advanced economy. Mesken et al. found in Katmandu, Nepal, a developing nation, that 30% of presentations to ER were for injury, 27% of presentations resulted in admission, <1% of patients had laboratory tests and no physicians had ER qualifications [5]. The Kirsch et al. study in Port-of-Spain, Trinidad and Tobago found that 42% of all presentations to ER were for injury, 41% were admitted, 9% had laboratory tests, there were no medical records and only one physician had completed any residency training [6]. Furthermore, there are no data from countries with a newly developed economy or those experiencing rapid, sustained development with a high per capita income [7].

The United Arab Emirates (UAE) is a union of seven sovereign sheikhdoms formed in 1971. The lifestyle of UAE citizens changed little over hundreds of years until modern development began 40 years ago. The UAE has been experiencing a booming petroleum-based economy since the 1970s, which has supported a dramatic surge in modernization and development such that UAE citizens now have one of the highest per capita incomes in the world [8,9].

The first hospital was built in 1949 but it was not until the late 1970s that a modern health infrastructure began to be created. The health care system has since undergone rapid development including the opening of a medical school in 1985 [10]. By the late 1990s, a sophisticated primary health

care system had been established. Expatriate physicians provide the majority of health care delivery and come from numerous different countries throughout the world.

As with other countries undergoing rapid development, there is an attempt to blend the old with the new. In a society where traditional healers were the sole custodians of health care until recently, many people, especially the elderly, continue to consult their traditional healers while learning to embrace Western medicine [11].

This study attempts to document the changes in the use of the ER by the elderly over the 10-year period 1989-1999. This period parallels dramatic changes in health care provision from a developing hospital focused structure to a sophisticated vertically integrated system offering primary, secondary and tertiary care. In particular, medical care for the elderly has begun to diverge from general medical care towards a separate specialty area. In 1989, the ER provided much of the medical care of the elderly, including assessment, intervention and referral. However, by 1999 the ER was providing a more systematic approach, using more of the principles of geriatric care that are routinely used by specialized geriatric assessment units. From the emerging trends, areas of need and potential intervention strategies can be identified, especially towards the establishment of comprehensive geriatric services in the UAE.

Methods

This study was a cross-sectional survey. The data were abstracted from the ER day-book by three trained abstractors who were registered nurses working in the ER. This handwritten ledger, which is completed by ER staff during each patient's visit,

was the only record available as no computerized data existed. The components abstracted were those listed in this data source: age, sex, date, time of arrival, time of departure, triage code ascertained on arrival, diagnosis at discharge from ER and whether during their ER stay the patient received laboratory tests, X-ray, intravenous access, specialist consultation, admission or transfer. The four-level triage code system used by the hospital was: (1) life-threatening, e.g. cardiorespiratory arrest; (2) acute, e.g. chest pain or cerebrovascular event with a conscious and alert patient; (3) urgent, e.g. undiagnosed abdominal pain with stable vital signs; and (4) non-urgent, e.g. upper respiratory tract infection.

All elderly people (defined as those aged 65 years and older [12]) who were seen in the ER of a major hospital in Al-Ain, UAE in the years 1989 and 1999 were included. In 1989, those aged 65+ years numbered 19 200 (1.2% of the total population of 1 633 200) with a female:male ratio of 0.96 [13]. In 1999, those aged 65+ years numbered 32 000 (1.1% of the total population of 2 938 000), with a female:male ratio of 0.89 [14]. The life expectancy at birth was estimated in 2000 to be 71.6 years for males and 76.6 years for females [15]. The low proportion of the population aged 65+ years and the gender ratio below 1 are similar to findings in other newly developed nations [15].

The study was in Al-Ain, whose total population grew from 211 500 in 1989 (13% of the total UAE population) to 359 100 in 1999 (12.2% of the total UAE population) [13, 14]. Unfortunately, no age distribution by region has been published. Throughout the period under study, the ER caseload in this health district was shared with only one other hospital. The ER was staffed entirely by expatriate doctors, mostly from Western countries; several

had ER board certification, many had undergone partial ER training and all had participated in residency programmes. There was an active continuing medical education programme.

The United Arab Emirates University Faculty of Medicine and Health Sciences Research Ethics Committee and Tawam Hospital, both of which comply with the ethical rules for human experimentation that are stated in the Declaration of Helsinki, approved the project.

SPSS version 10 and *Epi-Info* version 6 were used for statistical analysis. Comparative statistics were calculated using chi-squared analysis for categorical variables and analysis of variance for continuous variables. The level of clinical significance was set at $P < 0.05$.

Results

All patient entries were included in the study analysis. Data validity was confirmed by demonstrating >95% agreement between abstractors in a systematic sample of 100 patients.

The number of elderly individuals seen in the ER rose from 321 in 1989 to 1347 in 1999. The mean age \pm standard deviation was 72.9 ± 7.4 years and the female to male ratio was 0.78. The age and gender ratios statistically did not significantly change between 1989 and 1999.

There was a statistically significant rise in both the absolute number of elderly attendances (491 in 1989 to 2629 in 1999) and in the proportion of elderly in total attendances (3% in 1989 to 5% in 1999) ($P < 0.001$) (Table 1). The mean number of visits per person per year rose significantly from 1.8 ± 1.7 in 1989 to 3.3 ± 5.0 in 1999 ($P < 0.001$). The severity of illness on ar-

Table 1 Emergency room (ER) attendance among the elderly

Data on attendances	1989		1999		P-value ^a
	No.	%	No.	%	
<i>Patients</i>					
All ages	17184		55261		
Elderly (% of all attendances that year)	491	3	2629	5	< 0.0001
<i>Diagnosis</i>					
Respiratory	82	17	562	21	0.02
Cardiovascular	83	17	385	15	0.20
Abdominal	63	13	410	16	0.12
Musculoskeletal/trauma	89	18	317	12	0.0002
Genitourinary/breast	53	11	209	8	0.04
Neurological/ cerebrovascular/psychiatric	40	8	134	5	0.007
Metabolic	20	4	120	5	0.63
ENT/ophthalmological/ dental/dermatological	14	3	120	5	0.09
Haematology/oncology	11	2	31	1	0.06
Referred directly to primary care	7	1	284	11	< 0.0001
Other	29	6	57	2	< 0.0001
<i>Triage code</i>					
1. Life-threatening	7	1	14	0.5	0.04 ^b
2. Acute	99	20	171	7	< 0.0001
3. Urgent	316	64	1431	54	< 0.0001
4. Non-urgent	69	14	1013	39	< 0.0001
<i>Procedures carried out</i>					
ER laboratory tests	209	43	1058	40	0.34
ER X-ray	163	31	856	33	0.54
ER intravenous access	110	22	908	35	< 0.0001
ER specialist consultation	239	49	845	32	< 0.0001
Admitted from FR	205	42	513	20	< 0.0001
Transferred from ER	77	16	214	8	< 0.0001
<i>Length of stay in ER (minutes)</i>					
5-120	409	83	1827	69	< 0.0001
> 120	82	17	773	29	< 0.0001

^a χ^2 analysis. ^bFischer exact test.

P < 0.05 was considered significant.

ENT = ear, nose and throat.

rival to ER as reflected by the triage code fell significantly from 1989 to 1999.

The most significant change was an increase in non-urgent attendances among the elderly from 14% to 39% ($P < 0.0001$)

(Table 2). These attendances were mostly in the morning and in 1989 were less common in winter. The mean number of visits per person per year for non-urgent attendance rose from 1.08 ± 0.27 in 1989 to

Table 2 Non-urgent attendances among the elderly

Attendance	1989		1999		P-value ^a
	No.	%	No.	%	
Total triage code 4	69		1013		
<i>Arrival: time of day</i>					
Morning (07:00–12:59)	34	49	426	42	0.24
Afternoon (13:00–18:59)	20	29	268	26	0.46
Evening (19:00–23:59)	8	12	221	22	0.05
Night (24:00–06:59)	7	10	98	10	0.90
<i>Arrival: season</i>					
Summer (June, July, August)	15	22	235	23	0.78
Autumn (September, October, November)	18	26	252	25	0.82
Winter (December, January, February)	12	17	299	30	0.03
Spring (March, April, May)	24	35	227	22	0.02
<i>Diagnosis category</i>					
Respiratory	6	9	26	3	0.01 ^b
Cardiovascular	13	19	169	17	0.64
Abdominal	9	13	150	15	0.69
Musculoskeletal/trauma	13	19	123	12	0.10
Genitourinary/breast	4	6	91	9	0.37
Neurological/cerebrovascular/psychiatric	4	6	47	5	0.42 ^b
Metabolic	1	1	35	3	0.32 ^b
ENT/ophthalmological/dental/dermatological	34	83	8	0.25	
Haematology/oncology	4	6	7	1	0.004 ^b
Referred directly to primary care	7	10	262	26	0.004
Other	5	7	20	2	0.02

^a χ^2 test. ^bFischer exact test.

P < 0.05 was considered significant.

ENT = ear, nose and throat.

1.37 + 1.12 in 1999 ($P = 0.04$). Most non-urgent attendances were for cardiovascular, abdominal or musculoskeletal/trauma problems. However, in 1999 there was a significant rise in non-urgent attendances "referred directly to primary care" from 10% to 26%, which then became the leading diagnosis ($P = 0.004$). This statistically significant fall in illness severity was seen across all age groups.

The most statistically significant change for all elderly attendees in primary diagnosis category on discharge from ER was a rise in those referred directly to primary care (1% in 1989 to 11% in 1999, $P < 0.0001$) (Table 1). Other significant changes included a fall in musculoskeletal/trauma (18% in 1989 to 12% in 1999, $P = 0.0002$) and a rise in respiratory illness from 17% in 1989 to 21% in 1999 ($P = 0.02$). There was

a fall in the number of patients requiring specialist consultations and being admitted or transferred to other institutions. This paralleled the fall in illness severity although the rate of diagnostic testing was unchanged, and the rate of establishing intravenous access rose significantly.

Discussion

This study has demonstrated a substantial change between 1989 and 1999 in both the number and nature of elderly people attending the ER. As demonstrated in Tables 1 and 2, in 1989 the elderly accounted for few attendances, had a high degree of illness severity and were often admitted. In contrast, the elderly in 1999, whose demographics were unchanged, were attending the ER in larger absolute and proportional numbers but were significantly less ill. In particular, the number of non-urgent visits rose 14.7 fold compared to a rise in all visits of 5.4 fold and a general population increase of older people of 1.7 fold.

The fall in illness severity is paralleled by a fall in specialist consultation rates and admissions to hospital. This decline suggests that in 1999 many people, including the elderly, chose the ER as their source of non-urgent medical care, despite the presence of an expanding primary care sector undergoing substantial development. This may explain the fall in the proportion of cases seen with emergency problems such as musculoskeletal/trauma and the rise in respiratory illness with time.

Despite the decline in illness severity, there was no decline in ER investigations performed for elderly patients. This possibly reflects the worldwide trend for a higher rate of investigations in the ER since 1989. Similarly, the rise in intravenous access rates possibly reflects this modern ER practice.

The rise between 1989 and 1999 in the absolute number of attendances by older people may reflect a growing acceptance of Western-style medical care in this traditional society. Of those attending for urgent care, there may have been an increasing acceptance of presenting earlier in the course of their illness. Although there was no evidence to suggest a significant change in the overall prevalence of disease, we might have expected a decline, especially for infectious disease, as a result of improved sanitation and nutrition.

The ER aims to provide both care for those with emergency medical conditions and others with non-emergency problems unable to access alternative care [16]. However, although common practice, the ER is not an ideal location for the latter form of care, for clinical and economic reasons [17,18]. Hence, the rising use of the ER for non-urgent care as seen in this study is cause for concern. Perhaps this decline of illness severity on presentation to the ER, which parallels development and modernization of the health care system, reflects changes that occurred in Western countries at some time in the past. As most of these patients were seen at times when primary care clinics were open and their attendance was evenly distributed across the seasons, an appropriate course of action may be a public education campaign on the different roles of the ER and primary care centres to direct people to the appropriate place to seek care.

This study found that in the UAE, a rapidly developing country, ER attendance by the elderly significantly changed over time, with rising use and falling illness severity. The next phase in development for a country such as the UAE is the further development of medical services for the elderly to encompass a comprehensive system of health care that includes life-threatening and terminal conditions.

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