Incidence of type-2 diabetes mellitus among Emirati population in Ajman, UAE

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ABSTRACT
Diabetes Mellitus (DM), particularly type-2 is a major public health concern worldwide. Studies from UAE report that among the total cases of DM, 31% are type-2. Not much information is available with regard to the incidence of DM in UAE. This study aimed at determining the incidence rate of diabetes mellitus among Emirati population in Ajman, UAE. This study was conducted in all PHCs (Madinath, Hamidiya, Mushrif, Muziereh and Manama) and Khalifa and GMC hospitals, Ajman, UAE where the Emirati population primarily go for diagnosis and treatment. The incident cases of diabetes mellitus were collected during the period 2010 January to December.

From the case files of 2010, data was abstracted/extracted retrospectively, for all those who were newly diagnosed to have diabetes mellitus. A total of 158 cases detected in 2010, 54 were among non-Emiratis and one was type-1 diabetes. Eliminating these, the remaining 101 were included in the analysis.

The age of the patients ranged from 23 years to 78 years; 35 (34.7%) males and 66 (65.3%) were females. The overall incidence observed was 4.8/1000PY with a female predominance of 6.3/1000PY against incidence among males of 3.3/1000PY. With regard to age specific incidence rate among males, it increases with age till 60 years and then showed a decreasing trend. Among females also the same trend was observed but not as similar to males. The highest incidence rate was observed in the 55-59 aged groups among males, 23.4/1000PY and females, 32.4/1000PY. Among males the incidence rate was much less compared to females in - the age groups older than 59 years.

Studies from other parts of the world report incidence rates, 4.3/1000PY (UK-2005), 5.3/1000PY (USA-2004) and 6.3/1000PY (Canada-2011). This study also observed a similar incidence.

Keywords: incidence, diabetes mellitus, Ajman, UAE

INTRODUCTION
Diabetes mellitus (DM) is one of the most common chronic diseases, which is on the rise globally1-3. The prevalence of diabetes for all age groups worldwide was estimated to be 2.8% in 2000 and projected to be 4.4% in 2030 and the total number of people with diabetes is expected to rise from 171 million to 366 million in 2030 during this period4. Several explanations have been given for this increase in number and prevalence like population growth, aging, urbanization, increasing prevalence of obesity and physical inactivity5.

Diabetes poses a challenge not only to those living with the disease but also to their families, communities and the health care system. Monitoring the prevalence and incidence trend of diabetes is important to assess the national burden of the disease, to describe the impact of risk factors, to develop interventions
and to project needs for future health services\textsuperscript{4,10}.

The states in The Co-operation Council for the Arab States of the Gulf (GCC) exhibit some of the highest rates of type 2 diabetes in the world. Five of the International Diabetes Federation’s ‘top 10’ countries for diabetes prevalence in 2011 and projection for 2030 belong to this region\textsuperscript{11}. The recent and rapid socio-economic development of the GCC countries has been associated with this rising prevalence\textsuperscript{12}. The International Diabetes Federation suggests that the number of people with diabetes in its Middle East-North Africa region will increase to 83% by 2030\textsuperscript{11}.

In the United Arab Emirates (UAE) the prevalence rate has reached 24% in national citizens and 17.4% in expatriates\textsuperscript{13}. The prevalence rate for diabetes in the UAE was ranked to be the second highest in the world (19.5%) in 2007, and the expected prevalence for 2025 is 21.9\%\textsuperscript{12}. The UAE, have developed a National Diabetes Care Continuum (DCC) program with Guidelines to combat this disease\textsuperscript{13}. A population study in Al Ain, in the UAE showed Age-standardized prevalence rates for DM (diagnosed and undiagnosed) and pre-diabetes among 30-64 years old to be 29.0 and 24.2\%, respectively\textsuperscript{14}. No published data is available about the age standardized incidence rates of diabetes in the UAE. Such data are important since information on incidence will help in planning specific preventive and control strategies, and will increase our knowledge about the profile of this disease in the UAE. Hence, this study was conducted to determine the age and gender specific incidence rate of diabetes mellitus among nationals in Ajman Medical District for the year 2010.

**MATERIALS AND METHODS**

The study population consisted of residents of Ajman Emirate. Total population of Ajman Emirate as per 2005 census is 206997 (males 131684 and females 75313). Population in all ages and both genders constituted the study group. The age and gender distribution of Ajman population is given in table-1. All subjects diagnosed as having diabetes mellitus during the year 2010 were studied through a Cohort approach.

![National Map of Ajman Emirate](image-url)

The research instrument was prepared by the team of investigators. The draft instrument was pilot tested and then finalized. Every copy of the research instrument had a code number to identify the Primary Health Centre and the cases. The instrument had the domains such as socio-demographic characteristics, clinical data, biochemical parameters, mode of management etc.

Approval was obtained from Ethics and Research committees of Gulf Medical University and Ministry of Health before the start of the study. Prior approval was sought from the Director of Ajman Medical District to conduct the study in Primary Health Centers. Anonymity of the study subjects was maintained by not identifying them by their names and maintaining confidentiality of the research data.

This cohort study was conducted in the five Primary Health care Centers, Sheikh Khalifa hospital, and GMC hospital Ajman Emirate. Case abstracting was done by a research assistant trained in data collection. Cases of diabetes mellitus were documented retrospectively by studying the medical records for the period 1 January 2010 to 31 December 2010. Incident cases were collected by looking into the date of diagnosis. The cases diagnosed for the first time during the study period were included as incident cases.
The diagnostic criteria used:
1. Diabetes was defined as fasting plasma glucose (FPG) concentration of $\geq 126$ mg/dl or a previous diagnosis of diabetes,
2. Impaired fasting glucose (IFG) was a fasting plasma glucose concentration between 110 mg/dl and 126 mg/dl, and normoglycemia as FPG < 110 mg/dl,$^{12}$
3. When the criteria (1) and (2) were not met, the notes made by doctors elsewhere were relied upon.

Emirates ID number or Health insurance ID number of nationals and Complete address, Emirates ID number and health insurance number of expatriate cases were recorded to eliminate duplication. Data files fed into the Excel spread sheet were transformed to SPSS 20 version for statistical analysis. The crude and specific incidence rates were calculated. The incidence rate was presented for different age-groups with 5 years class interval and confidence intervals for the proportions estimated.

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<th>Females</th>
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<tr>
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<td>5708</td>
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<td>2685</td>
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<tr>
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<td>21000</td>
<td>43000</td>
</tr>
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RESULTS
A total of 158 new cases were diagnosed during the period 2010, of which 102 were Emiratis and the remaining from other nationalities. Among the 102 Emiratis one case was type-1 diabetes. The remaining 101 cases of type-2 diabetes were included in the estimation of incidence rate. The age range was from 23 to 78 years.
The overall incidence rate observed among those aged 20 years and over was 4.8/1000PY. In the present study 35 (34.7%) patients were males and 66 (65.3%) were females with a female predominance. The gender specific incidence rate observed was 3.3/1000PY for males and 6.3/1000PY for females. The age specific incidence rate for males and females are given in figure 1. The incidence rate is almost similar among males and females until the age 39 years. Whereas participants with 40 years and above showed a higher incidence rate among females compared to males. The highest incidence rate was observed in the 55 and 59 years age group and then a downward trend was seen, the incidence rate among males was 23.4/1000PY and among females was 32.4/1000PY.

**DISCUSSION**
The present incidence study reports a similar pattern of detection of Type-2 diabetes among Emiratis in Ajman, UAE up to 39 years of age group in both males and females and in the later age groups it shows a female preponderance. A study from UK reported the incidence of DM as 4.4/1000PY in the year 2005. A more recent data from UK showed a crude incidence rate of type 2 diabetes of 515/100000 (or 5.15/1000PY) in 2010. The study observed that the incidence increased with age and was similar among males and females up to 40 years of age. After 40 years old males had higher incidence rate compared to females. The gender specific incidence rate was 4.86/1000PY for men and 4.31/1000PY for women. A study from USA, using data from New York City Community Health Survey observed an overall incidence rate of DM of 10/1000PY, with a male predominance. The rate was 11/1000PY for males and 9/1000PY for females. The report “Diabetes in Canada” showed that the overall incidence of DM was 6.3/1000PY in 2011. The gender specific rates showed a male predominance (6.8/1000PY) compared to that of females (5.7/1000PY). Overall incidence rate of DM in China was 9.5/1000PY with a male predominance of 11% compared to 6.2% in females. In Taiwan a study reported that the overall (20-79 years) incidence rate was 11.6 per 1000PY. A report from Sweden revealed that the incidence rate (20-100 years) was almost the same with the overall rate reported for other countries.

![Figure 2: Gender-wise Crude Incidence rate for diabetes in the different countries](image-url)
among males and females, 3.92/1000PY and 3.64/1000PY respectively\(^2\). The comparison of crude incidence rates in different countries is given in figure 2.

The age specific rates from Sweden showed an age-wise increasing trend for both males and females. Only ten year age specific incidence rate was available in Sweden. The highest rate was observed in 70-79 years with 9.94/1000PY for males and 7.77/1000PY for females. The age specific incidence rate was 0.20, 0.54, 2.37, 4.68, 7.46 per 1000PY respectively for the age group 20-29, 30-39, 40-49, 50-59 and 60-69 years among males and 0.29, 0.70, 1.71 and 3.57 per 1000PY respectively for females\(^3\). The age specific incidence rate of Canada is compared with the present finding and is given in fig.3 and fig.4. The rate is almost similar at the age of 40 years. The peak is observed in 55-59 years and then a downward trend is seen. In the case of Canada, a steady increase is observed with increasing age. With regard to females, the incidence rate

![Figure 3: Age specific rates of Diabetes mellitus in Ajman and Canada- Male](image)

![Figure 4: Age specific rates of Diabetes mellitus in Ajman and Canada- Female](image)
is much higher in Ajman compared to Canada. There is an increasing trend in the case of incidence rate of Canada.\textsuperscript{18} There are limitations in this study. The incident cases were collected from five PHCs Ajman, Sheikh Khalifa hospital and Gulf Medical College Hospital, in Ajman. There are chances of Emirati population getting detected at other hospitals also and hence underestimation is a possibility. Even with this limitation we can conclude that the incidence rate is high compared to UK and Sweden.

REFERENCES