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years) to register all diabetic subjects. The percent registered by the end of the next Seventh 5-year Plan (2006-2010) is predicted to be near to 8%. Still at that time, the needs of one third, or even more, of Omani subjects would be unmet for management by 2010. Therefore, unmet needs for diabetes care, as well as other non communicable diseases, for example, hypertension and obesity should be tackled in the next Strategic Health Developmental Plan.

Unmet needs in diabetes actually do not stop at the level of diagnosis and registration, but it exceeds to cover investigating unmet needs for diabetes self-care knowledge and skills associated with patient-centered outcomes of diabetes self-care (namely, awareness of self-care components, and adherence to it). Furthermore, it also extends to cover the unmet needs for management of diabetic complications as renal replacement therapy (RRT) for diabetic subjects with end-stage renal failure (ESRF). Diabetic renal disease is a common complication and is the most prevalent cause of end stage renal disease (ESRD) in the western world.⁴ According to the ESRD program in the United States the number of existing patients with terminal renal insufficiency caused by diabetes more than tripled between 1990-2001.⁵ Unfortunately, our health information system does not include data on the prevalence of ESRF among diabetics or the causes of ESRF in subjects under RRT to project the demands for RRT of diabetic subjects with nephropathy. Such demand is expected to increase due to demographic transitions and the increasing prevalence of diabetes. Also, to mention the unmet needs for timely referral of diabetic subjects with any of the diabetes complications as renal impairment. Parmar⁶ concluded that an unexpected passive improvement in glycemic control of a patient with history of poorly controlled glucose concentrations should provoke the primary care physician to check for a recent decline in renal function.⁴

The primary risk factors for CAD are diabetes, hypertension, high cholesterol, overweight, cigarette smoking and physical inactivity. The first 4 of these risk factors may cluster in some persons and have been identified as components of a syndrome known as metabolic cardiovascular syndrome or the deadly quartet.⁶

The study subjects of the NHS, 2000 were divided into 5 groups according to having one or more of the 4 CAD risk factors, namely hypertension, high cholesterol, diabetes, overweight or obesity. **Table 1** shows that only 28% of the study subjects were free from the 4 CAD risk factors, namely, 72% of Omani adults aged 20 and above of both gender had at least one CAD risk factor.⁷ Approximately 35% had only one risk factor of the above mentioned 4. Approximately 25% of the

Diabetes in Oman

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Diabetes mellitus (DM), as a well-known risk factor for coronary artery diseases (CAD), is a major public health dilemma worldwide generally and in Oman specifically. The prevalence of DM is increasing in Oman as in other Gulf countries.^{1,2} Its early signs could be detected as early as 7 years before its diagnosis. Nevertheless, impaired fasting glucose (IFG, namely, fasting blood glucose [FBG] = 6.1-6.9 mmol) could yield finally to DM unless preventive measures and changes in lifestyle are adopted. Moreover, IFG could be considered, as DM, a CAD risk factor. Therefore, early diagnosis of IFG and DM and registration of Omani diabetic patients in the Ministry of Health (MOH) facilities is crucial for their monitoring and follow up.

Albeit there is an increase in the crude number of registered DM patients and its percent of total population aged 20 and above from 2.39% in 1999 to 4.64% in 2003³, the pace of such increase could, with doubt, be viewed as satisfactory especially if the percentage of registered DM patients to total population aged 20 and above would be predicted in the year 2011 as 7.92% by linear regression equation. Three percent of the population aged 20 and above were registered as DM patients in 2000, whereas 4% of the same age group screened were caught as old DM patients (namely, aware of having DM) in the National health survey, 2000 (NHS, 2000).⁴ It denotes under-registration from one side and poor community awareness of DM on the other. Recent studies in the Kingdom of Saudi Arabia² showed that only 27.9% of diabetics were unaware of their condition. Astonishingly, albeit the readily available access to health care facilities in the Sultanate of Oman, only one third of Omani diabetic subjects knew that they had diabetes.¹

Given the increasing prevalence of DM in Oman, the risk of changing from the IFG status to DM, and the relatively slow pace of DM patients registration, it would be unlikely in the near future (the next 5

subjects had 2 risk factors, and 10% had 3 risk factors. The fifth group, having the 4 risk factors were 2% of the sample. The mean(s) of diastolic blood pressure, fasting blood sugar, serum cholesterol, and body mass index increased significantly on aggregating of risk factors ($p < 0.05$). Non communicable diseases (NCDs) such as chronic medical condition take a long time to show its full blown picture or to develop its complications. Therefore, we should be concerned on impaired fasting glucose or any similar borderline state of NCDs, even though the cutoff point to diagnose it has not been reached. Living in rural areas was a protective from belonging to the group of having 2 or more risk factors in the NHS 2000. Accordingly, we are expecting unmet needs for NCDs diagnosis and care to be more likely in urban areas. Metabolic cardiovascular syndrome is considered as a public health problem in Oman as aggregation or clustering of the risk factors seemed to be common. Increasing the awareness of both policy makers and health care providers by disseminating the survey results as well as the community through health education is crucial. Closer liaison between those primarily caring for patients with NCDs and secondary or higher levels of care specialist such as cardiologists, nephrologists, ophthalmologists, and neurologists is required to ensure effective surveillance of the diseases and its complications, and to increase early referral. Despite the integrated management of diabetes and hypertension in Omani primary health care facilities, there is still a call for a holistic approach to subjects with any of cardiovascular risk factors along with a more effective referral system. Such gaps in the process of management of NCDs are not exclusive for Oman or the developing

countries. In England, among those with diabetes there is considerable unmet need for cardiovascular risk factor intervention, particularly for hypertension and raised cholesterol.⁸ In the same context, it is common to encounter a mild hypertensive subject with IFG or overweight in the Omani primary care settings. The question to pose is whether the need to monitor, and follow-up this metabolic indices has been met or not. Therefore, we are expressing our concerns on the real need for evaluating the effectiveness of existing interventions in non-communicable diseases, in addition to identifying areas with higher unmet needs.

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Table 1 - Comparison of means of coronary artery diseases (CAD) risk factors among groups of subjects with none, one or more CAD risk.

	Overall sample	No risk factor	one risk factor	2 risk factors	3 risk factors	4 risk factors	F	p
N of subjects (%)	5660 (100)	1586 (28)	1970 (34.8)	1394 (24.6)	598 (10.6)	112 (2)		
Diastolic blood pressure mean	80.4	75.3	78.7	83.2	90.4	95.6	496.3	<0.05
Fasting blood sugar mean	5.5	4.8	5.1	5.8	7.2	10.5	332.6	<0.05
Fasting serum cholesterol mean	5.1	4.2	4.9	5.7	6.1	6.5	712.3	<0.05
Body mass index mean	25.4	21	25.3	28.2	30*	30.9*	654.1	<0.05
* - All means' differences were significant below the 0.05 level by ANOVA- Turkey method except for the body mass index mean difference between the group of 3 risk factors and the group of 4 risk factors.								

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Viral gastroenteritis in Saudi children

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Viral gastroenteritis (GE) is one of the most common illnesses of children throughout the world. Human rotavirus is the leading cause of severe GE in infants and young children worldwide. A safe and effective vaccine providing early specific immunity would be the primary means for adequate control of this disease. Each country that consider using rotavirus vaccine may want to review the prevalence of rotavirus disease in their setting. Therefore, our primary goal was to determine the prevalence of viruses causing acute GE among children at King Khalid University Hospital (KKUH) in Riyadh, KSA. In addition, our secondary goal was to examine the association of prevalence of viral GE in relation to gender, age, and seasonal distribution pattern in this population.

This was a retrospective study carried out between January 1998 to December 2003 at the Virology laboratory at KKUH, KSA. A total of 614 stool samples were collected from children under the age of 12 years, who were seeking medical care for acute GE. They were either hospitalized in this hospital or seeking treatment as out patients. The studied children were classified into 5 groups according to their age as follows: 0-6 months, >6-12 months, >1-2 years, >2-5 years, >5-12 years. All stool samples were tested for the presence of rotaviruses group A antigen, enteric adenoviruses and astroviruses, using DAKO EIA kits (DAKO Ltd, Cambridgeshire, United Kingdom). The chi-square test (χ^2) was used to compare the prevalence rate of rotaviruses in relation to age and gender in the studied groups. A test of linear trend was conducted to determine whether positivity tended to change with age.

Of the 614 children involved in this study, 350 were boys (57%) and the rest 264 were girls (43%). Group A rotaviruses were detected in 156 samples (25.4%) whereas enteric adenoviruses were detected in 7 samples (1.1%). Of the 485 stool samples

Table 1 - Prevalence of rotavirus categorized by gender and age.

Factors	n of samples	Rotavirus +ve (%)	p-value
Gender			<i>p</i> =0.93655
male	350	89 (25.4)	
female	264	67 (25.4)	
Age groups*			<i>p</i> <0.00001
0-6 months	161	38 (23.6)	
>6-12 months	114	47 (41.2)	
>1-2 years	141	50 (35.5)	
>2-5 years	112	14 (12.5)	
>5-12 years	86	7 (8.1)	
Total	614	156 (25.4)	

p = 0.00016 by Chi-square for linear trend, +ve - positive

processed for astroviruses only 4 samples were found to be positive (0.8%). The difference in the number of processed samples for rotaviruses, enteric adenoviruses and astroviruses was due to the late introduction of astrovirus test in our virology laboratory. This test was introduced in April 1999. Co-infections were found only in 2 samples. Both were positive for rotaviruses and adenoviruses. Since the number of positive samples for enteric adenoviruses (7) and astroviruses (4) were small, the distribution of viral gastroenteritis according to gender, age and season was limited only to rotavirus infection. The prevalence of rotavirus infection among male and female children was statistically not significant (*p*>0.05), as shown in **Table 1**. However, the prevalence of rotavirus infection among the 5 age groups was statistically significant. The prevalence was 41.2% in the 6-12 months group, 35.5% in the 1-2 years group, and decreased dramatically in the children greater than 5 years to 8.1% (χ^2 -linear trend=14.235; *p*=0.00016) (**Table 1**). The monthly distribution of rotavirus infection was irregular, showing no seasonal variation, which indicated that rotavirus infection occurs all the year round. This study was concentrated on studying the prevalence of viral gastroenteritis in Saudi children under the age of 12 years over a period of 6 years. The low number of tested samples (614) in this study might be attributed to the fact that children with mild to moderate diarrhea were treated directly by the general practitioner or family pediatrician without confirmation from the laboratory. In this study, the overall prevalence of rotavirus infection was 25.4%, indicating it is the major cause of acute viral GE in children. This finding was in total agreement with that reported by other hospitals in Riyadh area, for example 14.1% at King Faisal