Original Article

Exposure of gasoline station workers to leaded gasoline in the Gaza Strip: Awareness and self reported symptoms.

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تعرض عمال محطات الوقود المحتوى على الرصاص في قطاع غزة: مدى الإدراك والأعراض المصاحبة.

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الخلاصة: تناولت الدراسة تقييم مدى الإدراك والأعراض المصاحبة الناتجة عن التعرض للوقود المحتوى على الرصاص لدى 105 من عمال محطات الوقود في قطاع غزة. وقد إستخدم الباحثون الاستبانات للحصول على المعلومات. بينت النتائج وجود مستوى عال من المعرفة لدى العمال عن التأثيرات الصحية للوقود المحتوى على الرصاص 88 (83.8%) وعن الرصاص كملوث للبيئة 89 (84.8%). وقد كان استخدام وسائل الحماية ضعيفا وكانت المعرفة لدى العمال ليس لها تأثير كبير على الممارسة، أي على استخدام أدوات الحماية في المحطة، ووجد أن الأعراض الصحية الأكثر شيوعا بين العمال هي الأعراض العصبية وتشمل الصداع 78 (74.3%) وضعف العضلات 74 (70.5%) والإثارة العصبية 66 (62.9%) وصعوبات في التركيز 65 (61.9%) واضطرابات في النوم 55 (52.4%)، وكان معدل انتشار الأعراض يزداد بزيادة سنوات العمل في المحطة (χ^2 corrected=7.713, P=0.021) وقد تبين أن استعمال قناع التنفس يحد بكفاءة من هذه الأعراض (χ^2corrected=8.325, P=0.004).

Abstract: Awareness and self reported symptoms among 105 gasoline station workers in the Gaza Strip were assessed. A cross section of workers was asked to fill in a questionnaire. Workers reported high level of knowledge on health effects of leaded gasoline 88 (83.8%) and lead as an environmental pollutant 89 (84.8%). Protective measures were poorly used. Knowledge seems not to have much influence on practice. The most common self reported symptoms were neurological symptoms including headache 78 (74.3%), fatigue 74 (70.5%), irritability 66 (62.9%), concentration difficulties 65 (61.9%), and sleep disturbance 55 (52.4%). The prevalence of symptoms increased with increasing years of work (χ^2 corrected=7.713, P=0.021). Use of respiratory mask in particular can potentially limit such symptoms (χ^2 corrected=8.325, P=0.004).

Keywords: lead, gasoline, Gaza, health.

Introduction:

Although leaded gasoline has been or is being phased out in many countries, it is still imported from Israel and widely used in the Gaza Strip [*1*]. Leaded gasoline contains tetraethyllead and, to some extent, tetramethyllead which are used as "anti-knock" additives to gasoline [*2*]. Therefore, leaded gasoline is identified as a source of lead pollution with adverse health effects in humans. Lead exposure in gasoline station occurs from lead fumes generated during filling cars, from cars emissions and from contaminated hands, food, water and clothing [*3*,*4*].

As a fume or fine particulate, lead is readily absorbed through the lungs. It is relatively less well-absorbed from the gastrointestinal tract. Inorganic lead is not absorbed through intact skin, but organic lead compounds (tetraethyllead, tetramethyllead) can be [*5*]. Once lead has been absorbed into the bloodstream, it is distributed between the bones and teeth, the soft tissues (kidneys, brain, liver) and the blood, and in part excreted in the urine and in bile [*6*]. With chronic exposure, most absorbed lead accumulates in the bone which ultimately provides a source of remobilization and continued toxicity after exposure ceases [*7*].

Personal habits and lack of protective measures at the workplace, and lack of awareness campaigns were reported to contribute in facilitating exposure to leaded gasoline [*8,9*]. Major symptoms of intoxication with leaded gasoline include headache, fatigue, irritability, impaired concentration, wrist/foot drop, nausea, dyspepsia, constipation, colic, lead line on gingival tissue, loss of libido and anemia [*10-12*].

Although leaded gasoline is being used in the Gaza Strip, there were a lack of data on awareness and self reported symptoms among gasoline station workers. In addition, poor use of protective measures during work in the station (personal observation) promoted the authors to conduct this study. Therefore, the overall aim was to assess various aspects of awareness and self reported symptoms among gasoline station workers exposed to leaded gasoline in the Gaza Strip. The objectives of this study were to answer the following research questions: (1) do gasoline station workers have knowledge on route of lead entry into the body, lead health effects and lead as an environmental pollutant?; (2) what is the workers attitude and practice towards the protective measures?; (3) does workers' knowledge reflect their practice towards the use of protective gear?; (4) what are the self reported symptoms among workers?; and (5) is there an association between the frequency of self reported symptoms and the use of protective gear?

Study area

The Gaza Strip is a part of the Palestinian coastal plain bordered by Egypt from the South, the green line from the North, Nagev desert from the East and the Mediterranean Sea from the West. The total surface area of the Gaza Strip is 360 km^2, where about 1,416,543 Palestinian people live and work [*13*]. The Gaza Strip is divided geographically into five Governorates: Northern, Gaza, Mid Zone, Khan Younis and Rafah. Gaza Strip is a poor area suffering from a long-term pattern of economic stagnation and plummeting development indicators [*14*]. The situation becomes even worse since Israel imposed extreme restrictions on the movement of goods and people in response to the new political situation in the Gaza Strip. Unemployment in Gaza is close to 40% and is set to rise to 50% [*15*]. The Gaza Strip suffers from many environmental problems including extensive use/misuse of pesticides, water pollution and lack of sewage and solid waste treatment [*16-18*]. Air pollution is another environmental burden in the Gaza Strip caused to a large extent by carbon monoxide, nitrogen oxide and lead emitted by petrol vehicles. Leaded gasoline imported from Israel [*19*] is still the predominant fuel grade in the Gaza Strip. Lead emitted from such fuel imposes serious health problems on both general population and gasoline station workers in the Gaza Strip.

Subjects and Methods:

Study design and target population

The investigation was a cross sectional study. The target population was gasoline station workers in the five Governorates of the Gaza Strip. The workers who did not meet the criterion of being involved in the work in the station during the spring of 2006 were excluded. For ethical consideration, the necessary approval to conduct the study was obtained from Helsinki committee in the Gaza Strip in January, 2006.

Sample size and sampling

The estimated number of legal gasoline stations registered in the Gaza Strip in the year 2006 was 81 distributed in the five Governorates of the Gaza Strip as follows: Northern (17), Gaza (27), Mid Zone (10), Khan Yunis (19) and Rafah (8). According to the municipalities of Gaza Governorates, Palestinian National Authority (Personal communication), the estimated total number of workers in Gaza Governorates was 208, distributed as follows: Northern (36), Gaza (77), Mid Zone (24), Khan Yunis (45), and Rafah (26). A stratified sample was used based on the number of workers in each Governorate and distributed as follows: Northern (18), Gaza (39), Mid Zone (12), Khan Yunis (23), and Rafah (13). Therefore, our sample size was 105 gasoline station workers.

Questionnaire interview

A meeting interview was used for filling in the questionnaire. All interviews were conducted face to face by one of the authors who had a Master Degree of Medical Technology. The questionnaire was based on adult lead poisoning questionnaire, and on that used in a similar study with some modifications related to work duration and practice [*20*,*21*]. The questionnaire was validated by four specialists in the fields of environment and public health, and their notes were followed. Most questions were one of two types: the yes/no question, which offers a dichotomous choice; and the multiple choice question, which offers several fixed alternatives [*22*]. A questionnaire was piloted among 10 gasoline station workers not included in the sample, and modified as necessary for improving reliability. The questionnaire included questions related to: personal profile such as age, marital status and education; Work duration; house location; knowledge on the route of lead entry into the human body, health effects of leaded gasoline and lead as environmental pollutant; and attitudes towards the work in the station and the effectiveness of the protective gear. Practice questions included: the wearing of protective clothes; smoking; eating and drinking during work; chewing gum; whether they drink milk frequently or not; and whether to have a water bath or not at workplace. Self-reported symptoms questions were also included in the questionnaire.

Limitations of the study

They included weak cooperation of some station owners who in some instances did not allow the workers to participate in the interview. Far distances between stations, and limitation of literature on awareness aspects of gasoline station workers were other obstacles.

Data analysis

Data were computer analyzed using SPSS/PC (Statistical Package for the Social Science Inc. Chicago, lllinois USA, version 13.0) statistical package. Simple distribution of the study variables and the cross tabulation were applied. Chi-square (χ^2) was used to identify the significance of the

relations, associations, and interactions among various variables. Yates's continuity correction test, $\chi 2$ (corrected), was used when not more than 20% of the cells had an expected frequency of less than five and when the expected numbers were small [*23*]. The result was accepted as statistically significant when the p-value was less than 5% ($p<0.05$).

Results:

Personal profile of the study population

Table 1 shows that age of the gasoline station workers (n=105) ranged between 19 and 65 years with mean age±SD 34.4±10.7 years old. A total of 88 (83.8%) were married; 7 (8.0%) had no children. Analysis of the educational status of the workers showed that 22 (21.0%) had a university degree, 38 (36.2%) had finished secondary school, 22 (21.0%) had finished preparatory school, and 23 (21.9%) had passed primary school. It is worth mentioning that none of the workers was illiterate.

Table 1. Personal profile of the study population (n =105).

Personal profile	No. (%)
Age (Year)	
<27	27 (25.7)
27-42	54 (51.4)
>42	24 (22.9)
Mean±SD (range)	34.4±10.7 (19-65)
Marital status	
Single	17 (16.2)
Married	88 (83.8)
Have children	81 (92.0)
Have no children	7 (8.0)
Education	
University	22 (21.0)
Secondary school	38 (36.2)
Preparatory school	22 (21.0)
Primary school	23 (21.9)

Work duration and house location

As indicated in Table 2, more than half of the workers 59 (56.2%) worked in the gasoline station for more than 5 years, whereas 26 (24.8%) and 20 (19.0%) of them worked for 2-5 and <2 years, respectively. It is worth mentioning that, all interviewed workers had no history of other lead-related job. House location in relation to some sources of lead pollution e.g. battery workshop, auto radiator workshop, garage and gasoline station is presented in Table 3. The total numbers of workers who mentioned that their houses are located at a distance of <50, 50-100 and >100 m from the sources of lead pollution were 13 (12.4%), 9 (8.6%) and 6 (5.7%), respectively. Although there are three small lead smelters in the Gaza Strip for manufacturing battery plates and sinkers, none of the workers mentioned that their houses are located near lead smelter.

Table 2. Work duration in the gasoline station of the study population (n =105).

Work duration (Year)	No. (%)
<2	20 (19.0)
2-5	26 (24.8)
>5	59 (56.2)

Table 3. House location in relation to some sources of lead pollution as reported by the study population (n=105).

House location	Distance (meter)		
	<50 No. (%)	50-100 No. (%)	>100 No. (%)
Battery workshop	1 (1.0)	1 (1.0)	1 (1.0)
Auto radiator workshop	2 (1.9)	1 (1.0)	0 (0.0)
Garage of cars	7 (6.7)	5 (4.8)	4 (3.8)
Gasoline station	3 (2.9)	2 (1.9)	1 (1.0)
Total	**13 (12.4)**	**9 (8.6)**	**6 (5.7)**

Workers' knowledge on route of lead entry, its health effects and lead as an environmental pollutant

When questioned about the possible routes of exposure to lead; 91 (86.7%) workers claimed that inhalation is the route of entry, followed by 34 (32.4%) who reported that skin is the route of entry, and 31 (29.5%) who claimed that the mouth is the route of entry of lead into the body (Table 4).

Table 4. Knowledge of gasoline station workers (n=105) on route of lead entry into the body, health effects of leaded gasoline exposure and lead as an environmental pollutant.

House near to	No. (%)
Route of lead entry into the body	
Inhalation	91 (86.7)
Skin	34 (32.4)
Mouth	31 (29.5)
Health effects of leaded gasoline exposure	88 (83.8)
Lead as an environmental pollutant	89 (84.8)

A total of 88 (83.8%) and 89 (84.8%) workers knew that leaded gasoline exposure do affect human health and that lead is an environmental pollutant, respectively. The variation in such workers' knowledge by their education levels was not found to be significant (Table 5). In addition, results showed that workers who did not use protective gear had more knowledge on route of lead entry, its health and environmental effects than those who did (Table 6), indicating that knowledge does not necessary to reflect practice. However, the interaction between use of protective gear and knowledge of workers in this regard was not significant (P>0.05).

Attitudes of workers, attending training courses, and health professional visits to the station

A total of 37 (35.2%) workers (n=105) were against work in the station. However, as mentioned by workers, the main cause of engagement in such work was the lack of job opportunities in the Gaza Strip. A total of 81 (77.1%) workers believed that use of protective gear is effective in preventing lead exposure, whereas 24 (22.9%) had the opposite opinion. Neither workers attended training courses nor they had health professionals visited their station.

Table 5. Frequency and percentage of gasoline station workers' education in relation to their knowledge.

Knowledge about	Education				P value
	Primary school (n=23)	Preparatory school (n=22)	Secondary school (n=38)	University (n=22)	
Route of lead entry into body					
Inhalation *(n=91)*	18 (78.3)	20 (90.9)	32 (84.2)	21 (95.5)	0.637*
Skin *(n=34)*	9 (39.1)	8 (36.4)	11 (28.9)	6 (27.3)	0.776
Mouth *(n=31)*	9 (39.1)	8(36.4)	7 (18.4)	7 (31.8)	0.281
Health effects of leaded gasoline exposure *(n=88)*	18 (78.3)	19 (86.4)	31 (81.6)	20 (90.9)	0.897*
Lead as an environmental pollutant *(n=89)*	17 (73.9)	18 (81.8)	34 (89.5)	20 (90.9)	0.584*

* p value of χ^2 (corrected) test

Table 6. Use of protective gear among gasoline station workers (n=105) in relation to their knowledge.

Knowledge about	Using Protective gear (n=42) No. (%)	Not using Protective gear (n=63) No. (%)	p value
Route of lead entry into body			
Inhalation *(n=91)*	38 (41.8)	53 (58.2)	0.519*
Skin *(n=34)*	11 (32.4)	23 (67.6)	0.268
Mouth *(n=31)*	11 (35.5)	20 (64.5)	0.541
Health effects of leaded gasoline exposure *(n=88)*	35 (39.8)	53 (60.2)	0.913
Lead as an environmental pollutant *(n=89)*	34 (38.2)	55 (61.8)	0.375

* p value of χ^2 (corrected) test

Practices of gasoline station workers towards protective measures

Table 7 lists the different protective measures regularly used by gasoline station workers (n=105) during work at station. The highest number (n=30, 28.6%) wore gloves and the lowest number (n=1, 1.0%) wore hats or special boots. The causes of not using

such protective gear were carelessness 51 (48.6%), not provided 41 (39.0%), discomfortable 7 (6.7%), and not necessary 6 (5.7%). The number of workers who mentioned not smoking, not eating, not drinking and not chewing gum during work in the station was 51 (48.6), 17 (16.2), 17 (16.2) and 10 (9.5), respectively. A total of 47 (44.8%) were frequently drunk milk and 15 (14.3%) had a water bath after work at work place.

Table 7. Gasoline station workers (n=105) who reported using protective measures during work at the station.

Protective measures in use	No. (%)
Wear gloves	30 (28.6)
Wear goggles	3 (2.9)
Wear hat	1 (1.0)
Wear respiratory mask	10 (9.5)
Wear special boots	1 (1.0)
Wear overall	15 (14.3)
Not smoking during work	51 (48.6)
Not eating during work	17 (16.2)
Not drinking during work	17 (16.2)
Not chewing gum during work	10 (9.5)
Frequently drink milk	47 (44.8)
Have water bath at work place	15 (14.3)

Prevalence of self-reported symptoms

The recall period was shortened to three months preceding the interview to minimize the possibility of recall bias. Table 8 lists the prevalence of self reported symptoms among gasoline station workers (n=105), with headache being the most common (n=78, 74.3%) and seizures the least common (n=1, 1.0%). A total of 95 (90.5%) workers had 2 or more self reported symptoms. However, one worker (1.0%) recalled one poisoning cases associated with leaded gasoline exposure. There was a significant increase in the prevalence of self reported symptoms with increasing years of work in the station (χ^2 corrected=7.713, P=0.021) as illustrated in Table 9. In addition, Table 10 pointed out that the interaction between the use of protective gear and self reported symptoms was statistically significant only for respiratory mask (χ^2 corrected=8.325, P=0.004).

Table 8. Self reported symptoms related to leaded gasoline exposure of the gasoline station workers (n=105).

Symptoms	No. (%)
Neurological symptoms	
Fatigue	74 (70.5)
Irritability	66 (62.9)
Coma	4 (3.8)
Convulsion	3 (2.9)
Headache	78 (74.3)
Concentration difficulties	65 (61.9)
Sleep disturbance	55 (52.4)
Seizures	1 (1.0)
Hearing loss	22 (21.0)
Wrist/foot drop	39 (37.1)
Non-neurological symptoms	
Loss of libido	33 (31.4)
Nausea	50 (47.6)
Dyspepsia	45 (42.9)
Constipation	49 (46.7)
Abdominal pain	39 (37.1)
Lead line in gingival tissue	18 (17.1)
Renal pain	15 (14.3)
Hypertension	52 (49.5)
Infertility	3 (2.9)
Have 2 or more symptoms	95 (90.5)

Discussion:

Leaded gasoline imported from Israel is still the predominant fuel grade in the Gaza Strip [*1,19*]. Lead emitted from such fuel imposes serious health problems on both gasoline station workers and general population in the Gaza Strip. Therefore, the present work was intended to assess various aspects of awareness and self reported symptoms among gasoline station workers exposed to leaded gasoline in the Gaza Strip. The result that none of the workers found to be illiterate do reflect a well educated community.

Such finding may give the impression that the high rate of educated workers is a result of them not getting another job because of the unemployment

crisis in the Gaza Strip. In addition, restriction of jobs in the Gaza Strip forced the study population to be engaged in gasoline stations.

Regarding work duration and history, the finding that more than half of the workers worked in the gasoline station for more than 5 years and that all workers had no history of other lead-related job may imply that most of lead exposure coming from the workplace.

The result that a higher proportion of gasoline station workers were more aware of inhalational of leaded gasoline than other routes of exposure agrees with other studies which have found that most occupational exposure to lead occur through inhalation [*12,24*].

Table 9. Distribution of the study population (n=105) by prevalence of self reported symptoms in relation to education, yearly work duration and house location.

Variable	Have symptoms (n=95)* No. (%)	P value **
Education		
Primary school *(n=23)*	22 (95.7)	0.936
Preparatory school *(n=22)*	20 (90.9)	
Secondary school *(n=38)*	34 (89.5)	
Diploma or University *(n=22)*	19 (86.4)	
Work duration (Year)		
<2 *(n=20)*	15 (75.0)	0.021
2-5 *(n=26)*	22 (84.6)	
>5 *(n=59)*	58 (98.3)	
House location (Meter)		
<50 *(n=13)*	13 (100)	0.916
50-100 *(n=9)*	7 (77.8)	
>100 *(n=6)*	6 (100)	

* Workers reported 2 or more symptoms
** p value of χ^2 (corrected) test

The small number of workers (<10%) lived <50 meters distance from other lead sources and the no significant relation between house locations and self reported symptoms (p=0.916) probably support this view.

Table 10. Prevalence of self reported symptoms among gasoline station workers (n=105) in relation to protective gear in use.

Protective gear in use	Have symptoms (n=95)* No. (%)	p value**
Wear gloves		
Yes *(n=30)*	27 (90.0)	0.793
No *(n=75)*	68 (90.7)	
Wear goggles		
Yes *(n=3)*	3 (100)	0.669
No *(n=102)*	92 (90.2)	
Wear hat		
Yes *(n=1)*	1 (100)	0.166
No *(n=104)*	94 (90.4)	
Respiratory mask		
Yes *(n=10)*	6 (60.0)	0.004
No *(n=95)*	89 (93.7)	
Wear special boots		
Yes *(n=1)*	1 (100)	0.166
No *(n=104)*	94 (90.4)	
Wear overall		
Yes *(n=15)*	15 (100)	0.378
No *(n=90)*	80 (88.9)	

* Workers reported 2 or more symptoms
** p value of χ^2 (corrected) test

Knowledge of workers on the effects of leaded gasoline exposure on human health and lead as an environmental pollutant was high. However, it seems that workers' education had no significant influence on their knowledge (p>0.05).

The majority of workers did not use protective measures during work in the station. The reason for not using protective gear as claimed by workers was carelessness, not provided, discomfort and not necessary. Such practice in combination with personal habits and lack of control measures at workplace could put workers at risk of lead exposure [*8*]. In addition, workers who did not use protective gear had more knowledge about route of lead entry, its health effects, and lead as an

environmental pollutant than those who did. This implies that Knowledge does not have much influence on practice. Also, the positive attitude of workers towards the effectiveness of protective gear in preventing lead exposure seems not to translate into practice.

Neither workers attended training courses related to the hazards of leaded gasoline nor they had health professionals visited their station. This is an alarming issue that necessitates urgent campaign represented by introducing seminars and training courses, and frequent health professionals' visits to the gasoline stations. Such action would alleviate lead exposure and poisoning among workers. It was reported that workers should receive training courses including instruction about the use and care of appropriate protective equipment and on the manner of wearing them [*25*,*26*].

Regarding self reported symptoms associated with leaded gasoline exposure, results showed that the most common self reported symptoms among gasoline station workers were neurological symptoms including headache, fatigue, irritability, concentration difficulties, and sleep disturbance. These findings require urgent prevention, intervention, and protection from the Ministry of Health and other non-governmental organizations. Similar data were reported in many countries, including the neighboring ones [*27-30*].
According to the present data there was a significant increase in the prevalence of self reported symptoms with increasing years of work in the gasoline station. This positive relationship means that increasing work duration led to increase workers exposure to leaded gasoline and put their health at higher risk. Lead toxicity was more frequently encountered with longer term occupational lead exposure [*31*,*32*].
When related to protective gear use, the prevalence of self reported symptoms was not significantly different among workers who did and those who did not use such protective gear except for respiratory mask. This indicates that 1) inhalation is the main route of lead entry into human body in occupational setting, a conclusion supported by workers' knowledge on route of lead entry into the body and 2) use of respiratory mask in particular can potentially limit exposure to lead hazards. It was recommended that appropriate protective work clothing and equipment including mask or respirators should be provided to all workers by the employer [*33*].

Conclusions:
Gasoline station workers in the Gaza Strip are still exposed to leaded gasoline. Despite their knowledge on health effects of leaded gasoline exposure, the use of protective measures was poor. This implies that knowledge does not have much influence on practice. The most common self reported symptoms were neurological symptoms including headache, fatigue, irritability, concentration difficulties, and sleep disturbance. There was a significant increase in the prevalence of self reported symptoms with increasing years of work in the station. Use of respiratory mask in particular can potentially limit such symptoms. Prevention and intervention programmes regarding the use of protective measures and monitoring the health status of gasoline station workers should be implemented.

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Editorial

Socio-cultural aspects of diabetes care: *Myths about diabetes in Qassim region, Saudi Arabia.*

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Diabetes mellitus is a current and growing worldwide concern. It has a high and increasing prevalence, and is associated with high levels of morbidity and mortality. This has led to the establishment of international organisations to approach the problems caused by diabetes and other chronic diseases. These are now acknowledged as one of the 'top 6' Global Risks by the World Economic Forum (1). A 2006 UN resolution (61/225) called on Member States to implement strategies to manage the diabetes problem (2).

The prevalence of diabetes and high associated economic costs are a serious challenge to policy and planning in healthcare. The costs include those relating to morbidity, employment, productivity, premature mortality and use of health services (3). Studies such as the Diabetes Control and Complications Trial and The UK Prospective Diabetes Study have demonstrated that effective management can help prevent the disabling and costly complications of diabetes (4 - 6). Despite, however, mobilisation of great efforts against the disease, target outcomes have not been met, internationally. A Swedish survey, for example, reported in 2001 that only 34 % of people with type 2 diabetes had good metabolic control (HbA1c < 6.5 %; 7). Grant *et al* (8) reported, in 2005, a 34 % attainment of HbA1c levels < 7 % in the USA, and a 2006 Australian study of 3, 286 records of patients with diabetes showed approximately 48 % had HbA1c > 7 % (9). With evident difficulty meeting the 'standardised' (inter-)national targets, the vogue (in some countries/guidelines) has moved towards individualised care and outcome targets (e.g. 10). Similarly, despite the co-ordination of management efforts from the highest international levels, it has been increasingly appreciated that strategies against global health problems should be locally targeted to be optimally effective – perhaps most conspicuously in the case of HIV management (e.g. 11, 12).

In this trend, Sharaf *et al* (this volume; 13) have undertaken to determine the 'myths and misconceptions' surrounding diabetes in a region of Saudi Arabia (the country estimated to have the 3rd highest prevalence of diabetes in the world; 14). Often, it is local health beliefs, trends in education and other socio-cultural dimensions that are considered the most variable aspects of a geographically widespread health issue, and thus these are considered relatively important issues when aiming to provide optimal individualised (or at least relatively locally targeted) care. Thus, studies such as those of Sharaf *et al* can provide the knowledge about these factors that allows healthcare professionals to in turn provide the necessary education and care for the successful treatment of the particular patient. This is an increasingly important and relevant issue as medicine is practised in an ever more globalised environment.

Although Sharaf *et al* do not establish the most predominant misconceptions, or those with greatest impact on health outcomes, nor establish that the 'misconceptions' they identify are limited to the particular population or region studied, they do highlight some that may

be of relatively high relevance to this population. For example, the 3rd and 4th most frequently believed of the various investigated 'myths' were that 'some types of dates do not increase sugar level' and 'honey intake does not increase sugar level', particularly relevant given that populations of the Gulf region consume relatively large amounts of dates and honey. Islam recommends some special foods, including honey and dates. It is believed that they can treat many diseases, and serving dates with coffee is a symbol of hospitality in this region.

However, the most striking results of Sharaf *et al* – the 1st and 2nd most frequently believed 'myths' - are misconceptions that have been identified as common in other cultures and countries. The most common misconception reported was that 'consuming sugar causes diabetes'. As the authors note, Rai and Kishore (15) report similar findings from India, and an American Diabetes Association survey suggests that roughly 32 % of US Americans believe the same (16). The second most common myth identified in the Saudi study was that 'people with diabetes should avoid sweets'; again, this belief seems to be common among US Americans (16-17).
Although perhaps we might forgive some of these 'misconceptions' as misunderstood responses to relatively generalised statements about diabetes, the various studies do probably suggest that education about diabetes is grossly suboptimal regardless of geography. Relatively poor outcomes of diabetes care have been associated with factors including ineffective education, misconceptions about the condition, lack of support, lack of patient involvement and inadequate knowledge (18, 19). This want of education, and the suggested scale of misconception about the condition, is a public health disaster.

We have recently systematically reviewed the management of type 2 diabetes in the states of The Co-operation Council for the Arab States of the Gulf, and our investigation revealed not a single (reported, audited) public health intervention. Although the situation is less severe in some regions, these studies seem to demonstrate that, quite apart from a need for locally tailored, (culturally-relevant education programmes, there is a need for cross-cultural education at the most basic levels. Certainly, such education may be more successfully delivered if sensitive to local cultural issues, but we are so far *unable* to suggest that with regard to diabetes education, the most efficient way to achieve a reasonably enhanced understanding of the disease and its management would be to design specialised programmes for each of the regions requiring of intervention. This, itself may be another myth.

It is important that we are aware that we – as much as those we aim to de-mystify – are entangled in myths. Myths are born of ignorance. They fill the gaps our knowledge leaves. We are reliant on studies such as those of Sharaf *et al* to demonstrate these gaps.

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Report

Meeting Report: Heart Failure 2010.

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Heart failure is defined as the inability of the heart to supply sufficient blood flow to meet the rigorous demands of body [1]. It is a global term for the physiological state in which cardiac output is insufficient for the body's needs. It occurs most commonly when the cardiac output is low and is also known as "congestive heart failure" (CHF) because the body becomes congested with fluid. Over time, conditions such as coronary artery disease or high blood pressure gradually leave the heart too weak or stiff to fill and pump efficiently [2]. The term 'heart failure' is often used incorrectly to describe other cardiac illnesses, such as heart attacks (myocardial infarction) and cardiac arrest. Heart failure is a common, costly, disabling and potentially deadly condition. It is an especially important problem in the elderly (Jugdutt, 2010). Around 2% of adults suffer from heart failure in developing countries, but in those over the age of 65, this increases to 6–10%. The disease is associated with significantly reduced physical and mental health, resulting in a markedly decreased quality of life. With the exception of heart failure caused by reversible conditions, the condition usually worsens with time. Although some patients survive many years, progressive disease is associated with an overall annual mortality rate of 10%.

Heart failure presents a serious challenge to the health authorities because of the high health expenditure associated with treating patients. In the United Kingdom alone 2% of the total budget of the National Health Service in the United Kingdom is spent on heart failure patients. The figure is much larger in the United States, around $35 billion in the United States.

Common causes of heart failure include myocardial infarction (heart attacks) and other forms of ischemic heart disease, hypertension, valvular heart disease and cardiomyopathy. The rise in diabetes, hypertension and obesity has resulted in increased cases of heart failure. Heart failure can cause a large variety of symptoms such as shortness of breath and exercise intolerance. Heart failure is often undiagnosed due to a lack of a universally agreed definition and challenges in definitive diagnosis. Treatment consists of lifestyle measures (such as weight control and decreased salt intake) and medications, and sometimes devices or even surgery.

Personalized management of heart failure can be considered across the entire spectrum of this disease, from monogenic disorders, to modifier genes and pharmacogenomics (Mestroni et al., 2010). Monogenic disorders that cause heart failure are the cardiomyopathies. In this

[1] http://www.heart.org/HEARTORG/Conditions/HeartFailure/Heart-Failure_UCM_002019_SubHomePage.jsp

[2] http://www.mayoclinic.com/health/heart-failure/DS00061

disease, recent guidelines have been introduced to assist the clinician in molecular diagnostics, genetic counselling and therapeutic choices. Several lines of evidence suggest the existence of common polymorphic variants of genes that modify the susceptibility to heart failure (modifier genes) (Mestroni et al., 2010).

The European Society of Cardiology (ESC) Guidelines for the diagnosis and treatment of acute and chronic heart failure 2008 have been published by the Task Force for the Diagnosis and Treatment of Acute and Chronic Heart Failure 2008. These guidelines have been developed in collaboration with the Heart Failure Association of the ESC (HFA) and endorsed by the European Society of Intensive Care Medicine (ESICM) (Task Force for Diagnosis and Treatment of Acute and Chronic Heart Failure 2008 of European Society of Cardiology, Dickstein et al., 2008).

This brief meeting report highlights the key findings of the Heart Failure 2010 Congress held in Berlin, Germany from 29 May to 1 June 2010, for which the editor of Annals of AlQuds Medicine, Dr. Haitham Idriss, was press registrant.

Websites:
http://www.annalqudsmed.com ,
http://www.escardio.org/congresses/hf2010/scientific/pages/scientific-programme.aspx
and:
http://spo.escardio.org/Welcome.aspx?eevtid=38

Implanted pulmonary pressure monitoring devices reduce heart failure hospitalisation

Implanting heart failure patients with a new device to monitor pulmonary artery pressure, involving wireless sensing communications technology, resulted in a 30 % reduction in heart failure hospitalisations at six months and a 38 % reduction in annualized (taking into account the entire follow up period averaging 15 months, calculated as an annual rate of decrease) in heart failure hospitalisations. The study reported by the phase III CardioMEMS Heart Sensor Allows Monitoring of Pressure to Improve Outcomes in NYHA Class III Heart Failure Patients (CHAMPION) Trial at the Heart Failure Congress 2010 showed reductions in pulmonary arterial pressures for patients implanted with the monitoring device, increases in the number of days alive and outside hospital and improvements in quality of life. This device has already been evaluated in a recent study for ambulatory assessment of pulmonary artery pressure in heart failure (Verdejo et al., 2007). "Identifying early rises in pulmonary arterial pressure is important because it's the most direct sign of congestion," said William Abraham, one of the co-principal investigators of the study from the Division of Cardiovascular Medicine at The Ohio State University Medical Centre (Columbus, Ohio). He added that until now the only available approach was for patients to monitor weight gain, which has a low sensitivity in predicting heart failure hospitalisations of only 10 to 20 %. "The idea is that if we identify elevated pressures we can quickly treat patients proactively, titrating their medications to bring them back into the normal range, thereby avoiding episodes of heart failure decompensation where patients often need emergency room admissions." Results of the trial are currently being used for regulatory approval of the CardioMEMS device around the world.

Genetically Targeted Therapy Shows Promise in Severe Heart Failure

The heart's ability to contract, and thus to pump blood and maintain oxygenation of the body, is determined by a continual re-loading of the sarcoplasmic

reticulum with calcium ions. SERCA2a is membrane bound enzyme expressed in the myocardium (Inesi et al., 2008). It is a P-type ATPase pump that regulates myocardial calcium cycling and contractility. SERCA pumps have been linked to a variety of human diseases (Hovnanian, 2007). Recent studies have established clear associations between depleted SERCA2a enzymes in cardiac cells and progression of end stage heart failure. "As the heart begins to fail the SERCA2a levels get depressed, leading to a vicious cycle where the heart fails even more," explained Dr. Greenberg, one of the authors of the study. MYDICAR® is a genetically targeted enzyme replacement therapy designed to restore levels of SERCA2a in the heart. With MYDICAR®, developed by CelladonCorporation (La Jolla, California), the SERCA2a gene is delivered using recombinant adeno-associated viral vector (AAV), a naturally occurring virus that approximately 90% of the population have been exposed to with no evidence of harm. MYDICAR® is provided in a single dose delivered directly into the coronary arteries during a short outpatient procedure, performed in a standard cardiac catheterization laboratory via a small incision in the upper leg. MYDICAR® is then carried to the heart muscle where it is taken up within the cells of the heart. Previous studies using reagents similar to MYDICAR® have shown delivery of the SERCA2a gene to skeletal muscle in humans results in persistence of gene activity for longer than four years. This study highlighted that the risk for clinical cardiovascular (CV) events was reduced by 50% for patients with severe heart failure receiving MYDICAR® as opposed to placebo. It is important to point out that this was a very small and early phase trial and further clinical research is required to support these promising preliminary findings.

Correction of iron deficiency with intravenous iron therapy improves renal function in heart failure

Impaired renal function affects many patients with chronic heart failure (Besarab et al., 2009; Silverberg et al., 2008; Silverberg et al., 2010). The inflammation related to heart failure impairs the release of iron from stores in the liver and macrophages. Patients with heart failure (HF) often have renal dysfunction and patients with kidney disease develop congestive HF, therefore the concept of cardio-renal syndromes evolved which can be a chronic or acute cardio-renal syndrome. This is known as chronic cardio-renal syndrome (Attanasio et al., 2010). Recent work from the nephrology literature suggests that addressing this iron deficiency by intravenous iron may improve renal function in patients with chronic renal disease (Silverberg et al., 2009). "Many patients with chronic heart failure have renal dysfunction which is strongly related to poor health outcomes. None of the therapies currently recommended for CHF patients have a favourable effect on renal function. Thus, there is great interest in treatments which may have renal protective properties," explained Professor Piotr Ponikowski, from the Medical University, 4th Military Hospital (Wroclaw Poland). A phase III study originally reported in 2009 has demonstrated that treatment with intravenous FCM (Ferinject®) in iron deficient chronic heart failure patients was well tolerated and significantly improved symptoms, NHYA functional class, six-minute-walk distances and quality of life. The treatment effect on renal function of Ferinject® was independent of the level of renal function at the start of the study, or of age, sex, CHF severity, magnitude of left ventricle dysfunction, the presence of anaemia and diabetes mellitus. The investigators were able to demonstrate that therapy with FCM in iron deficient

patients was associated with an improvement in renal function, already seen after 4 weeks, which persisted until the end of the study (6 months later).

New treatment strategy for heart failure patients with central sleep apnea

Central sleep apnea (CSA) occurs when the brain fails to send the correct signals to the diaphragm, causing patients to lose the natural pattern of breathing during sleep. CSA is an increasing problem in adults and children throughout the world. Breathing patterns in patients with CSA are characterized by cycles of increased breathing followed by shallow breaths with periods of no respiratory effort. It is different from obstructive sleep apnea (OSA), which occurs when lungs work normally but the breathing passages collapse temporarily during sleep. Sleep disruption has been linked with heart failure (Naughton and Lorenzi-Filho, 2009). Studies show that approximately 75% of Heart Failure patients have sleep disordered breathing, with half having CSA and half OSA (Sharma et al., 2010; Javaheri, 2010).

According to a Polish and US feasibility study presented at the Heart Failure Congress stimulation of the phrenic nerve has the potential to effectively treat central sleep apnea (CSA). In the current study, investigators from five centres in the US and Poland set out to explore whether stimulating the phrenic nerve (the nerve controlling the diaphragm) would prevent CSA. Clinical data showed phrenic nerve stimulation in patients with CSA and heart failure delivered improvements in the central apnea index, oxygen saturation levels and arousal index. "Heart failure patients, even those who appear to be doing well, hyperventilate probably as a result of subtle increases in their pulmonary artery pressure. Hyperventilation reduces CO_2 concentrations in the blood and brain, and as CO_2 levels fall below the apnea threshold the brain tells the body to stop breathing until CO_2 levels rise above that threshold again, " explained Professor William Abraham, one of the collaborating investigators from The Ohio State University (Columbus, OHIO).***Alpha-defensins: novel biomarkers in heart failure?***

A biomarker is a biochemical entity used to measure the progress of a disease or the effects of treatment on clinical outcome. In medicine the term refers to a protein measured in blood, whose concentration reflects the presence or severity of a disease state. Biomarker discovery, qualification and validation have traditionally been the domain of human clinical medicine and the preclinical research that underpins the drug discovery process.

Alpha-defensins are part of the innate immune system, and are present in the circulation during infection and non-infectious inflammation (Schneider et al., 2005; Soehnlein et al., 2009). These proteins are also involved in the lipoprotein metabolism in the vessel wall, favouring LDL and lipoprotein accumulation and modification in the endothelium and the extra cellular matrix. Low-grade inflammation might be an underlying mechanism during development and progression of chronic heart failure. Christensen and colleagues from Copenhagen University Hospital evaluated the plasma levels of alpha-defensins in 193 chronic heart failure patients and 98 healthy controls. The patients were followed up for a median of 2.6 years (range 0.5 to 3.9 years) with regard to mortality and new ischemic events. Their results suggest that alpha-defensin levels in chronic heart failure patients are associated with increased all-cause mortality and risk of new ischemic

events. Their study suggests that alpha-defensins may become useful cardiac biomarkers in cardiovascular research.

Research on disease pathogenesis and novel therapies for heart failure is urgently needed. New information about the pharmacogenomics of heart failure could be used to personalize and optimize heart failure therapy based on the patient's genetic profile. This is not merely science fiction; advances in post-genomic technologies will continue to propel personalized medicine from the bench to the bedside. Physicians (cardiologists in particular) will need to reshape clinical diagnostics paradigms, learn how to use new genomic information to change management decisions, and provide the patients with appropriate education and management recommendations (Mestroni et al., 2010).

Relevant Future Meetings

The Heart Failure Association will be having a winter meeting in 2011. The meeting will be held from 26 Jan 2011 - 29 Jan 2011 in Les Diablerets, Switzerland. This meeting will focus on integrative basic sciences relevant to heart failure. Further information may be found on their website: http://www.escardio.org/communities/HFA/meetings/Pages/winter-research-meeting.aspx.

The Kaufman Center for Heart Failure at the Cleveland Clinic and the American Association for Thoracic Surgery (AATS) have organised an educational event for health care providers specialising in the treatment of heart failure. The event entitled: '21st Century Treatment of Heart Failure: Synchronizing Surgical and Medical Therapies for Better Outcomes' will take place from 21-22 October 2010 at the InterContinental Hotel and Bank of America Conference Centre in Cleveland, Ohio. The meeting bring together two of America's leading cardiovascular specialty organizations to address the growing problem of heart failure. Therapies for heart failure are continuously evolving. Consequently there is an acute need to bring the leading experts together in educational events to share the latest reports and clinical trials on the current medical and surgical therapies for heart failure patients. Highlighting the key areas of activity in this area of research will increase the quality of care and the outcomes of therapy in heart failure patients.

Topics will include:

- Insights into Controversial Medical and Surgical Treatments
- Strategies for Slowing Heart Failure Progression with the Use of CRT-D
- Quality Metrics and their Impact on Cardiovascular Disease Practice
- Management of Acute Myocardial Infarction and Shock
- Surgical Management of Ischemic Cardiomyopathy
- Cardio-Renal Interactions
- Patient Selection for Mechanical Circulatory Support
- Long Term Management of the Patient on Mechanical Circulatory Support
- Contemporary Experience with New Pumps

Website: http://www.clevelandclinicmeded.com/live/courses/2010/heartfailure10/overview.htm

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Prevailing Myths and Misconceptions about Diabetes Mellitus in Qassim Region of Saudi Arabia.

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Abstract:

Objectives: To identify the prevailing myths and misconception about Diabetes Mellitus among diabetics and non- diabetics attending primary health care centers in Qassim region of Saudi Arabia.

Methods: We conducted a cross sectional study in 8 randomly selected Primary Health Care (PHC) Centers of Qassim Region from April to July 2010. The study included diabetic and nondiabetic patients attending PHC Centers. Data was collected by 880 pre-tested, self administered questionnaires of which 110 questionnaires were distributed in each PHC Center of Qassim Region. Questionnaire included a sections on socio-demographic information (age, sex, education, marital status and occupation), as well as questions about prevailing myths and misconceptions on diabetes mellitus. Data was analyzed by using SPSS (version 12 for Windows).

Results: The common prevailing myths in the population of Qassim region were, consuming sugar causes diabetes (71.6%), diabetics should avoid sweets. (65.8%), some type of dates do not increase sugar level (53.3%), honey intake doesn't increase sugar level (45.3%), and diabetes mellitus can affect sexual performance in its early stages (40.6%). There is significant difference in response according to educational status (P= 0.044), but there was no significant difference in gender, history of diabetes mellitus and family history of diabetes.

Conclusion: There are many myths and misconceptions surrounding diabetes mellitus in Qassim region, which complicate the disease and health-seeking behavior. Launching of a health education program is required with participation of staff and medical students of College of Medicine, Qassim University.

Key words: Myths; Misconceptions; Diabetes Mellitus.

الاعتقـــادات الخاطئـــة الســـائدة حـــول مـــرض الســـكر فـــي منطقـــة القصـــيم فـــي المملكـــة العربيـــة الســـعودية

الخلاصة:

الأهداف: تحديد الاعتقادات الخاطئة السائدة حول مرض السكر في منطقة القصيم في المملكة العربية السعودية.

الأساليب: أجرينا دراسة مقطعية في ثمانية من مراكز الرعاية الصحية في منطقة القصيم خلال ابريل - يوليو 2010 م, تم اختيار المراكز عشوائيا بين مرضى السكري والمرضى المراجعين للمراكز الصحية سواء مصابين أو غير مصابين بمرض السكر. تم جمع العينات من خلال 880 استبيان بمعدل 110 استبيان لكل مركز صحي ويشمل الاستبيان بيانات معلومات اجتماعية وديموغرافية (العمر ، الجنس ، والتعليم ، والحالة الزواجية والمهنة) ، وشملت أيضا أسئلة عن الاعتقادات الخاطئة بمرض السكر. وتم تحليل البيانات باستخدام برنامج الإحصاء للعلوم الاجتماعية (الإصدار 12 ويندوز).

النتائج: كان نسبة الاعتقاد الخاطئ الأكثر شيوعا هو أن استهلاك السكريات يسبب مرض السكر (71.6 ٪), ثم الاعتقاد الخاطئ بأنه ينبغي على مرضى السكر أن يتجنبوا تناول الحلويات. (65.8 ٪) ، يليه الاعتقاد الخاطئ بأن بعض أنواع التمور لا يسبب ارتفاع السكر (53.3 ٪) ، ثم تناول العسل لا يزيد مستوى السكر (45.3 ٪) ، وأنه يمكن لمرض السكر أن يؤثر على الجنس في المراحل الأولى من المرض (40.6 ٪). هناك اختلاف كبير في الاستجابات حسب الحالة التعليمية (P= 0.044)، ولكن لم يكن هناك اختلاف كبير في الاعتقادات بين الذكور والإناث ، وبين المصابين بمرض السكر وكذلك بين الذين لديهم تاريخ عائلي لمرض السكر.

الخلاصة: هناك العديد من الاعتقادات الخاطئة وسوء الفهم محيطة لمرض السكرا في منطقة القصيم ، والتي قد تزيد مضاعفات هذا المرض. نحن بحاجة إلى برامج توعية صحية بشأن هذه الاعتقادات. يجب اشراك طلبة الطب في مثل هذه البرامج التوعوية.

الكلمات الدالة: الاعتقادات الخاطئة ؛ مرض السكر ، المملكة العربية السعودية .

Introduction:

Diabetes mellitus is the most common metabolic disorder, its prevalence varying widely worldwide and ranging from as low as <1% to >50% . The World Health Organization (WHO) estimates that more than 180 million people worldwide have diabetes. This number is likely to more than double by 2030 [1].

Diabetes Mellitus (DM) is major public health problem in Saudi Arabia. The overall prevalence of DM in adults is 23.7% in KSA during the recent years [2].

Even then, only few people have the right information about the disease. No study has been conducted in recent years in Saudi Arabia to assess the prevailing myths about diabetes mellitus and its impact on the health-seeking behavior.

Myths are popular beliefs or stories that have become associated with a person, community, or occurrence, especially when considered to illustrate a cultural ideal [3].

This false collective beliefs become part of cultural identity and used to justify a social behavior. They have a strong influence in the life of individuals and their way of living including seeking treatment during illness. Therefore, understanding the myths and misconceptions about diabetes mellitus is important in providing better care and health education to both patients and healthy individuals.

The population of the Qassim Region consists of people nearly of the same cultural identity as other parts of Saudi Arabia. Particularly, dietary habits, strong conviction of the various myths concerning diets, herbal treatment and sequelae of the disease, and this leads to a high risk of complications. Therefore, we aimed to identify the prevailing myths and misconception about diabetes mellitus in Qassim Region of Saudi Arabia.

Methodology:

We conducted a cross sectional study to identify the prevailing myths and misconceptions about diabetes mellitus among diabetic and non diabetic patients of both sexes who routinely visit PHC Centers in Qassim Region of Saudi Arabia. The study was carried out from April to July 2010. The total number of primary health care centers in Qassim Region is 144 and by random selection eight PHCs were selected for this study. By systematic random sampling, diabetic and non diabetic individuals were selected (every second diabetic and every fifth non diabetic individual reporting to a primary health care centre) as per inclusion criteria.

The questionnaire was developed based on international standards concerning the prevailing myths and misconceptions about diabetes mellitus [3] [4]. The opinion of PHC doctors was also taken in consideration through piloting 100 questionnaires to assess the administrative and procedural logistics. We also added a question to each myth asking the respondents why they chose a particular answer. The questionnaire was self administered and translated into Arabic. Questionnaires included a section on socio-demographic information (age, sex, education, marital status and occupation) besides prevailing myths on DM.

Calculation of the sample size was based upon the assumption that respondents who are convinced about the prevailing myths will constitute 50% ± 10% (40 – 60%) of the target population. Assuming 95% confidence interval ($\alpha = 0.05$), we calculated sample size of 100 per PHC Center,

which was increased to 880 to account for the design effect [5].

Data entry and analysis was carried out using SPSS (version 12 for Windows). We used Cronbach's Alpha test for reliability of the questions, the frequency to identify the prevailing myths in percent and cross-tabulation with Chi-squared test to detect statistically significant differences.

Inclusion criteria: Saudi personnel who are resident of Qassim region attending PHC Center, twenty years or over and who agreed verbally to participate in the study.

Exclusion criteria: Non-Saudis, those below twenty years and those who did not agree to participate in the study.

Ethical approval was obtained by ethical review committee, College of Medicine, Qassim University.

Results:

The reliability test of the questionnaire is 0.80 (Cronbach's Alpha test for reliability of the questions); above average.

Table 1 shows that the actual number of completed interviews in the surveys was 805, with respondent rate 91.5%, males 49.1%, and females 50.9%, diabetic 67.8% and non diabetic 32.2%.

Table 2 presents the most common myth in the community, namely that consuming sugar causes diabetes (71.6%), the 2nd being diabetics should avoid sweets (65.8%), 3rd being some types of dates don't increase sugar (53.3%), 4th being honey intake doesn't increase sugar level (45.3%) and 5th being that diabetes mellitus can affect sexual performance in early stages (40.6%).

We have some *labile groups* who gave answers other than yes or no e.g. Insulin causes addiction (29.9%), sour or bitter herbals can treat DM (28.0%).

Table 3 describes the percentage (%) of frequencies of responses, explaining the reason respondents choose a prevailing myth: **Why** consuming sugar causes diabetes? *Because:* -sugar raises the level of blood sugar (11.2%), - affects the pancreas (0.7%) and - no comments (65.8%). **Why** diabetics should not eat sweats? *because:* - sweets raise blood sugar (21.5%) - cause more complication (11.2%) and -no comment (65.8%). **Why** some dates don't raise blood sugar level? *Because*: - dates contain less sugar (27.7%), - no comment (58.8%). **Why** honey does not increase sugar level? *Because*: - it is pure (15.2%), - mentioned in Qur'an (6.2%) and - no comment (62.5%)…

Table 4. In this table comparison is made between commonly prevailing myths and less frequent myths of our study subjects.

Table 5 Mean knowledge scores by respondents' characteristics concerning prevailing myths, after assessing the accuracy of respondents, the prevailing myths was with significant difference in the **education level** (P= 0.044), but no significant difference in: **gender** (P= 0.604), **age** (P= 0.13) and **history of diabetes** (P= 0.362).

Discussion:

The reason for prevailing myths and misconception about diabetes mellitus are multi-factorial. These include lack of knowledge about diabetes, poor education, cultural beliefs and social misconception. It is very important to identify the prevailing myths in our community to be able to launch proper health education programs for control and prevention of diabetes mellitus.

In a hospital based study carried out in India similar results were found. Twenty two percent of respondents believe that consuming sugar causes DM and myths were more common among females [4].

A study carried out in Karachi, Pakistan in 2005 examined myths pertaining to diabetes mellitus among non diabetics. Respondents reported that they believed that DM is predominantly contagious (p= <0.03), diabetics becoming more ill (what does this mean?) (p=<0.009) and believed in spiritual treatment for permanent cure of diabetes (p=<0.006) [6].

In our own study, the most prevalent myth was that *Diabetic should not take sweets*, which is not true, as diabetics may consume small amounts of sweets and carbohydrate. Dates are consumed a lot in Saudi Arabia and there is a prevailing myth *about some types of dates* like (Shakra, Khalas, Wanana, Ajwa ...etc), containing little sugar, which is incorrect. The same is true for *honey* as some believe that if it is pure or because it is mentioned in Qur'an and Hadeeth that it does not raise the blood sugar among diabetics. The myth that *diabetes can affect sex* in early stages was also common, which is also not true.

There were *labile groups* holding beliefs about herbals curing diabetes, though some due to bad experience no longer believe in this. Similar studies in Pakistan reported that patients avoid herbals when they are soured [8], but still many in our study were not sure about the role of herbals. This group may be easily misinformed, but in the meantime represent a good target for health education.

There was a significant difference in prevailing myths in our study amongst respondents with different standards of education. This was also found by Nisar *et al* and Rai and Kishore [6] [7].

The prevalence of myths was similar among males and females, in contrast to what was found in India [7].Also, the prevalence myths were similar among diabetics and those with family history of diabetes mellitus.

To our knowledge, our study is the first study conducted in Saudi Arabia about the myths of diabetes mellitus. The reliability test of the questionnaire was above average and was also subjected to the significant test of accuracy of patients' response, which was very significant. We could also identify in our study the prevailing myths in Qassim region of Saudi Arabia, which should enable us to plan for effective health education programs for the control of diabetes mellitus.

There are some limitations in our study: **Firstly**, the possibility of 'smart' answer in the information given by those who needed help in filling the questionnaire; **secondly**, we used the word sweets in the questionnaire instead of carbohydrates to decrease the assumptions among patients of low standard education; **thirdly**, our question for 'why you choose this answer concerning the myth' was an open question, difficult to analyze, even if it gave us a lot of information.

Conclusion:

There are many prevailing myths and misconceptions surrounding diabetes mellitus, this delays the people from seeking doctor's advice, affects the control of the disease and even complicate it. We need to launch health education programs especially in PHC Centers about these myths and regular treatment of diabetes mellitus. We recommend also further research on a larger scale. Moreover, medical students should be involved in such activities to ingrain in them the importance of health education in the community related health problems.

Acknowledgements

Special appreciation for the all staff members of PHC Directorate in Qassim. We also acknowledge the effort of the medical students in the data collection from the field.

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Table 1: Percentage distribution of respondents by selected demographic characteristics, history of or family history of diabetes.

Respondent characteristics	*N=805*
	Percentage (%)
Response rate= 805/880 x 100 = **%**	91.5
Selected health sectors (8 PHC Centers) **: %**	
Buridah	50.1
Unizah	25.1
AlRass	24.8
Age-group: %	
20 – 29 years	16.0
30 – 39 years	25.0
40 – 49 years	27.0
50 – 59 years	19.5
60>	12.5
Gender: %	
Male	49.1
Female	50.9
Marital status: %	
Married	77.9
Divorced	03.4
Widowed	05.0
Single	13.8
Education (highest level achieved) : %	31.6
Primary/Preparatory school	14.3
Secondary school	22.1
University degree	26.7
Other (professional diploma, etc.)	05.3
Respondent has: %	54.3
Diabetes mellitus	
Family history of: %	67.8
Diabetes mellitus	

Table 2: Percentage distribution of frequencies of the response for each myth.

Respondent characteristic	Percentage (%)
DM is contagious	
yes	08.0
No	85.2
Others	06.3
No comment	00.5
* **Some dates don't increase sugar**	
yes	53.3
No	33.4
Others	12.4
No comment	00.9
*** Consuming sugar causes diabetes**	
yes	71.6
No	20.5
Others	07.3
No comment	00.6
DM is dangerous	
yes	65.5
No	27.7
Others	06.1
No comment	00.5
* **Honey intake doesn't Increase sugar level**	
yes	45.3
No	39.5
Others	14.7
No comment	00.5
** **Herbals can treat DM**	
yes	30.4
No	43.1
Others	25.2
No comment	01.2
****Sour or bitter herbals can treat DM.**	
yes	25.3
No	44.8
Others	28.0
No comment	01.9
* **DM can affect sex in early stages.**	
yes	40.6
No	34.3
Others	23.0
No comment	02.1
Increase dose of medication can suffice your unbalanced food intake.	
yes	27.0
No	55.9
Others	16.6
No comment	00.5
* **Diabetic should not take sweets.**	
yes	65.8
No	29.4
Others	04.3
No comment	00.4
****Insulin causes addiction.**	
yes	17.0
No	52.5
Others	29.9
No comment	00.5
****Less water intake can decrease urination among diabetics.**	
yes	06.6
No	18.0
Others	75.0
No comment	00.4

*** Prevailing myth**
**** Labile group (no specific answer), good target for health education.**

Table 3: Percentage distribution of frequencies of response and the reason of their choice of the myth.

Respondent characteristic	Percentage (%)
* **Why some dates don't increase sugar**	
Some dates contain little sugar	27.7
Others	01.0
No comment	58.8
All dates rich in sugar	12.5
* **Why consuming sugar causes diabetes**	
Affect pancreas	07.0
Rise of sugar level	11.2
If there is family history of DM	01.5
Others	14.5
No comment	65.8
* **Why diabetics should not take sweets**	
Rise of sugar level	21.5
More complications	11.2
No comment	65.8
Can take little	01.5
* **Why DM is dangerous**	
Affect heart, vision, kidneys and vessels	6.2
death	01.3
Others	34.5
No comment	58.0
* **Why honey intake doesn't Increase sugar level**	
If pure	15.2
Cure (Qur'an)	06.2
Others	14.7
No comment	62.5
No, it contains sugar	01.5
** **Why herbals can treat DM**	
Some herbals are good	08.7
No complications	00.6
Bad experience	21.7
No comment	68.9
****Why sour or bitter herbals can treat DM.**	
Contains no sugar	01.9
Neutralize sugar	08.1
Bad experience	19.6
No comment	70.4
* **DM can affect sex in early stages.**	
General weakness	01.0
Affect nerves	00.9
Affect blood supply	01.6
Others	27.3
No comment	69.2

*** Prevailing myth**
**** Labile group.**

Table 4: Assessing the accuracy of the respondents in reading and filling the questionnaire.

Myth 1	Vs.	Myth 2	Significance (P-value)
* Some dates don't increase sugar		* Too much sweets intake causes diabetes	P < 0.001
* Diabetic should not eat sweets		* Too much sweets intake causes diabetes	P < 0.001
* Some dates don't increase sugar		* Too much sweets intake causes diabetes	P < 0.001
* Honey intake Increases sugar level		* DM can affect sex in early stages	P < 0.001
* Sweets cause DM		** DM Contagious	P = 0.57
* Herbals can treat DM		* Sour or bitter herbals can treat DM.	P < 0.001

P values indicate the statistical significance of differences between 2 different myths.
***. Prevailing myth**
**** Less prevailing myth**
Not significant (P > 0.05)

Table 5: Mean knowledge scores by respondents' characteristics concerning prevailing myths, after assessing the accuracy of respondents.

Respondent characteristic	Some dates don't increase sugar	Significance (P-value)
Gender: %		
Male	49.1	P = 0.60
Female	50.9	
Age-group: %		
20 – 29 years	16.0	P = 0.13
30 – 39 years	25.0	
40 – 49 years	27.0	
50 – 59 years	19.5	
60 >	12.5	
Education (highest level achieved) : %		P = 0.04
Primary school	31.6	
Preparatory school	14.3	
Secondary school	22.1	
University degree	26.7	
Other (professional, Diploma, etc.)	5.3	
History of Diabetes Mellitus: %		P = 0.33
Yes	54.3	
No	45.7	

- **P values indicate the statistical significance of differences between a selected one prevailing myth and characteristic**
- **Not significant (P > 0.05)**.

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Case Report

Guillain-Barre Syndrome in a patient with systemic vasculitis suggestive of Churg-Strauss Syndrome.

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A 48-year-old man presented with pins and needle-like sensations in the fingertips and the toes of one week duration, which progressed to involve both feet. He had an episode of severe low back pain without radiation. Since then his walking started to deteriorate and he found it difficult to ambulate, and walk up or down the stairs without assistance. Over the next few days, his lower back pain resolved but his walking difficulties continued worsening. He experienced abdominal cramps few days prior to admission. He denied any bladder dysfunction, neck pains or any recent trauma or fever.

Two days later, he developed a rash that affected his axillary region, back, abdomen, and inner thighs. He reported dry cough, which was increasingly progressive for the last few days. He denied diplopia, dysphagia or disequilibrium. He took Amitriptyline and B-complex for two days which then he discontinued for lack of perceived benefits. The patient's past history included hypertension since the age of 18 and Gout.

On admission he was afebrile, with stable vital signs. The clinical examination was significant for minimal weakness of the upper and lower limbs. Deep tendon reflexes were equal and symmetric except for mild hyporeflexia of the right-sided ankle jerk and absent left-sided ankle jerk. There was a distal sensory loss in a glove-stocking distribution. In addition, the patient displayed a macular rash involving the axilla, inner thigh, lower abdomen, and lower back.

EMG study was indicative of a primarily demyelinating polyneuropathy as evidenced by prolonged latencies and F waves with motor greater than sensory involvement and probable distal conduction block. The findings were consistent, though not diagnostic of acute idiopathic demyelinating polyneuropathy (AIDP).

Lumbar puncture revealed elevated protein at 1.24 g/L with no cells MRI of the brain with and without gadolinium did not reveal any abnormalities. MRI of the cervical spine revealed evidence of right-sided C6-C7 disc herniation without evidence of cord compression. His VC was 1.8 (64% predicted). Intravenous immunoglobin therapy for the presumptive diagnosis of Guillain Barre Syndrome (GBS) was initiated on day one, but the patient's condition did deteriorate and he suffered from progressive weakness, he became essentially quadriplegic and was areflexic.

The maximum strength in all extremities was no more than 1 or 2/5. His vital capacity dropped to 1.4 liters and he was transferred to the intensive care unit. Routine laboratory investigations revealed the following:

leukocytosis of 22.1 with 31% eosinophils (>6000), normal hemoglobin and platelets, CRP was elevated and the coagulation profile was normal. Serum IgE was >5000. Stool analysis was negative for ova or parasites. Tests were within normal range for renal function, CK, lactate, blood gases, ESR, Rheumatoid factor, but slightly elevated liver enzymes. Serology was negative for Mycoplasma pneumonia, cytomegalo-virus, Epstein-Barr virus, Rubella, B. Burgdroferi, Varicella, HBsAg, and anti-HCV. A Positive p-ANCA was detected, and was positive for anti-MPO. CT chest, abdomen, and pelvis showed slightly enlarged axillary, mediastinal, para-aortic and mesenteric lymph nodes with patchy shadowing in the lung and single pulmonary nodule (see figures 1 and 2). It also showed slight hepatosplenomegally.

Endoscopy was also performed and showed mild gastritis and ulcerative iliocecal valve. Campylobacter jejuni was negative. Peripheral blood smear showed significant Eosinophilia, but the eosinophils were mature, and per our hematologist did show the picture of hypereosinophillic syndrome. Transbronchial biopsy was performed and revealed evidence of vasculitis with Eosinophilia. (figure 3). Skin biopsy was nonspecific. At this time a coexistent P-ANCA associated vasculitis with neuropathy was considered, and pulse dose steroid was initiated.

The question was whether to consider more aggressive immunosuppressive therapies, keeping in mind the vasculitis component of the diagnosis. Ultimately, cyclophosphamide was initiated. Later on patient showed some improvement and started to move his upper extremities with 3/5 strength. His vital capacity improved to 1.85 liters. He remained areflexic but his mental status and cranial nerves were not involved. The patient now is dramatically improving and receiving intensive physiotherapy.

Discussion:

Our patient presented with acute fulminant neuropathy which showed characteristic features of GBS. This was strongly suggested by the rapid progression of symptoms over days and this was supported by the EMG study and the CSF albuminocytologic dissociation. However, a high evidence of vasculitis was essentially present. The patient history of skin rash, gastrointestinal complains, cough, Eosinophilia with high IgE, Positive p-ANCA and the histopathological findings of the transbronchial biopsy were altogether pointing towards vasculitis.

In spite of the fact that mononeuritis multiplex is more specific for the diagnosis of vasculitis neuropathy, some literatures showed some evidence that the pattern of nerve involvement may become more symmetric in later stage of the disease. Many alternative pathophysiological sequences can be proposed in our patient. One possibility, that patient was in the eosinophllic phase of vasculitis of Churg-Strauss Syndrome, an early latent form of the disease, which confused putting up the diagnosis of GBS which was, in turn, the primary cause of the whole neurological sequences. An alternative view that of a common pathological insult triggering both GBS and vasculitis and ultimately leading to the fulminant course of the disease.

In summary, by illustrating the complex cases involving acute polyneuropathy, we stress the importance of more time spent to

diagnose the disease. The diagnosis of GBS should not preclude other underlying complex pathological processes that could participate actively in the disease, or underestimating the addition of any other modalities of management.

Acknowledgements: Special thanks to Dr. Deep Kayed (Neurologist) and Dr. Reem Bahtimi (Pathologist) at the American Hospital, Dubai, UAE.

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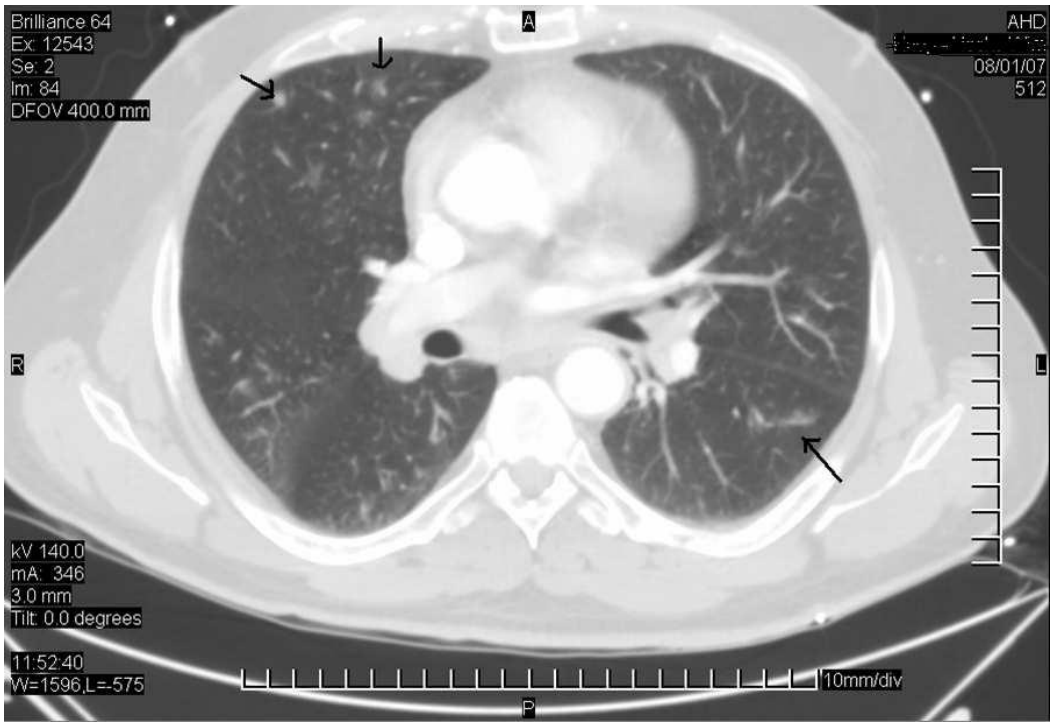

Figure 1: Chest CT scan showing patchy infiltrate in the RML, LUL and single pulmonary nodule in RML.

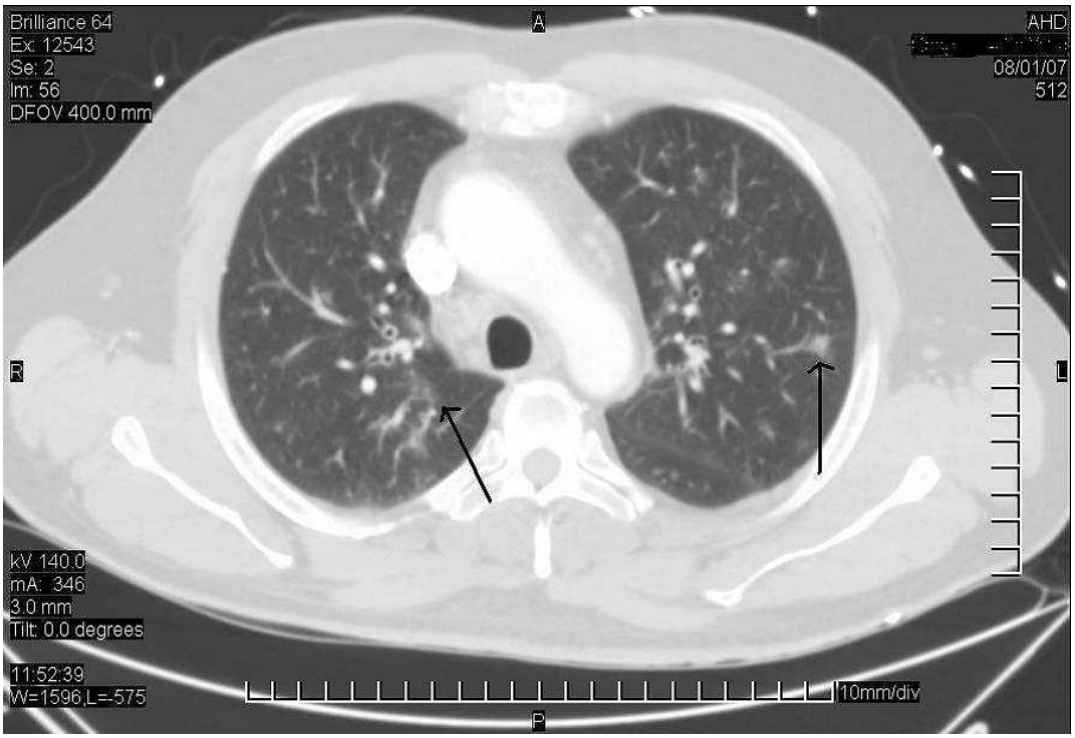

Figure 2: Chest CT scan showing patchy infiltrate (arrows) in the RUL, LUL.

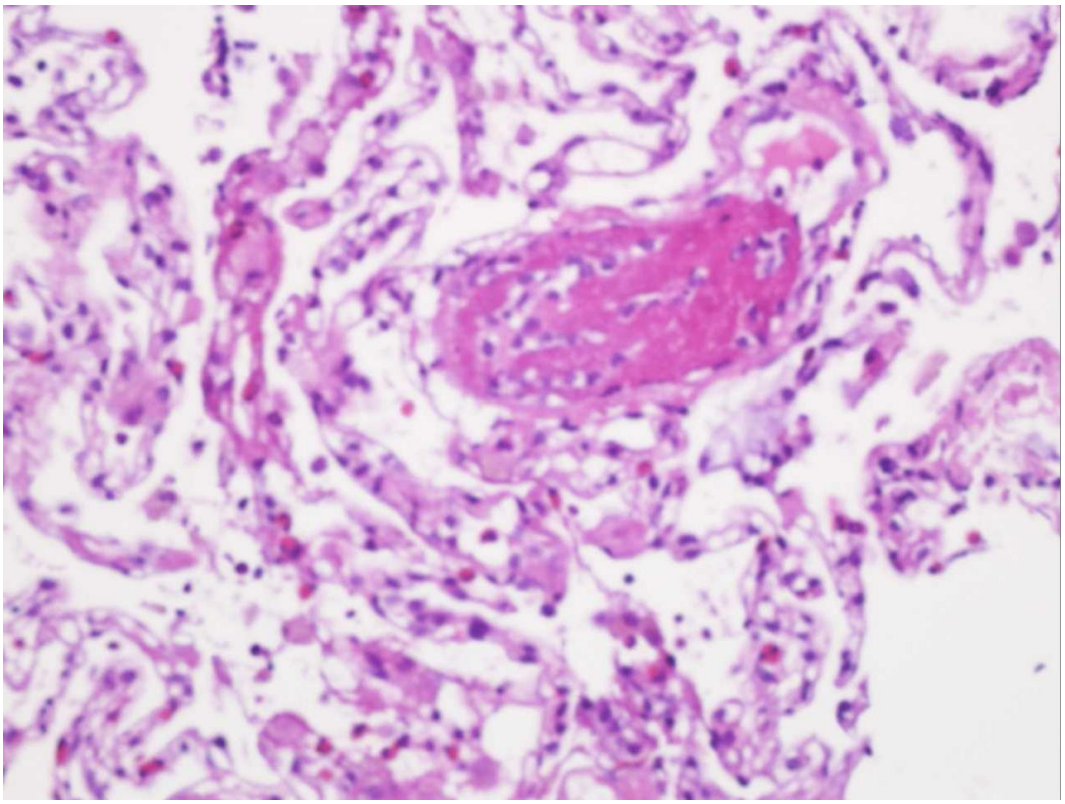

Figure 3: Focal vasculitis with eosinophils, compatible with Churg-Strauss syndrome.

Case Report

Diffuse alveolar hemorrhage and reactive airway disease induced by 1, 1-Difluoroethane.

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A 19 year old male nonsmoker presented to our Emergency Department with a one day history of cough, and hematemesis, with no previous history of gastrointestinal bleeding use of medication, or drug abuse.

His initial Hemoglobin was 13.2 g/dl, blood pressure 130/65, heart rate 100, with no orthostatic changes, O2 sat 95% on room air, Tempretaure 36.9. The patient has no fever, chills or any other signs of infection. The rest of his physical exam was normal. Upper Gastro-intestinal Endoscopy was unremarkable with no site of active bleeding identified.

Pulmonary consultation was sought to exclude other sources of bleeding. Upper airway exam did not disclose any bleeding site and the initial chest X-ray was normal. Fiber-optic bronchoscopy revealed diffuse hyperemia and multifocal slow oozing observed. Sequential bronchoalveolar lavage (BAL) samples from the right middle lobe were progressively more blood stained. The BAL showed numerous hemosiderin laden macrophages. BAL stains (GS, AFB, PCP, Fungus), cultures (routine, AFB, Fungus) and Cytology (for Viral bodies) all were negative. Repeat hemoglobin at 6 hours dropped to 9.8 gm/dl and oxygen saturation dropped to 88% on room air.

A diagnosis of diffuse alveolar hemorrhage was made and the patient was started on high dose methylprednisone (methylprednisolone-500 mg/d for 3 days) and antibiotics. Chest CT was done, showed diffuse micronodular/ alveolar opacities. (Fig 1, 2, 3). Urine analysis was normal. Erythrocyte sedimentation rate 32, INR, PTT wnl, Platelets count 350000/ml, Antinuclear Antibody, Anti-neutrophil cytoplasmic antibody (p-ANCA, c-ANCA) and Antiglomerular basement membrane antibody all negative. Pulmonary function studies showed an FEV1 of 62% predicted (85% post bronchodilator), FVC of 89% predicted and DLCO of 98% predicted.

On further questioning the patient admitted to a progressive cough over the previous few months coinciding with excessive use of a computer cleaning spray containing 1, 1-Difluoroethane at home, he denied any other exposure. The patient's condition improved significantly following initiation of treatment and 4 days later he was discharged home on oral prednisone 40 mg/day. Repeat Chest CT done 2 weeks later showed complete clearing of his lung fields. (Fig 4,5) and pulmonary

function studies (on tapering doses of prednisone) and 12 weeks (off prednisone) revealed a stable DLCO, but continued response to bronchodilators.

Final Diagnosis: Diffuse alveolar hemorrhage and reactive airway disease induced by 1, 1-Difluoroethane.

Discussion:

1, 1-Difluoroethane is a organofluorine compound with the chemical formula C2H4F2. This colorless gas is used as a refrigerant, where it is often listed as R-152a or HFC-152a. As an alternative to chlorofluorocarbons, it has a low global warming potential. (1). In addition to serving as a refrigerant, 1,1-difluoroethane is also commonly found in electronic cleaning products, and many consumer aerosol products.(1).

The practice of huffing "Duster" can be extremely dangerous or fatal. The intentional inhalation of 1, 1-difluoroethane caused a fatal cardiac arrhythmia in a 42 year-old man (1) .Some other reports of fatal car crashes have been linked to drivers huffing 1, 1-difluoroethane (2). Prolonged exposure to difluoroethane has been linked in humans to the development of coronary heart-disease and angina. It also can cause lower abdominal cramps (3).

According to the MSDS data potential health effects listed regarding inhalation that it may cause irritation of the eyes, skin and respiratory tract. High concentrations may cause dizziness, drowsiness, fatigue, headache and fainting, but exposure to 1,1-difluoro-ethane causing diffuse alveolar hemorrhage or reactive airway disease has not been previously reported. (4).

To my knowledge this is the first case of diffuse alveolar hemorrhage and reactive airway disease related to 1, 1-Difluoroethane overuse at home for computer cleaning.

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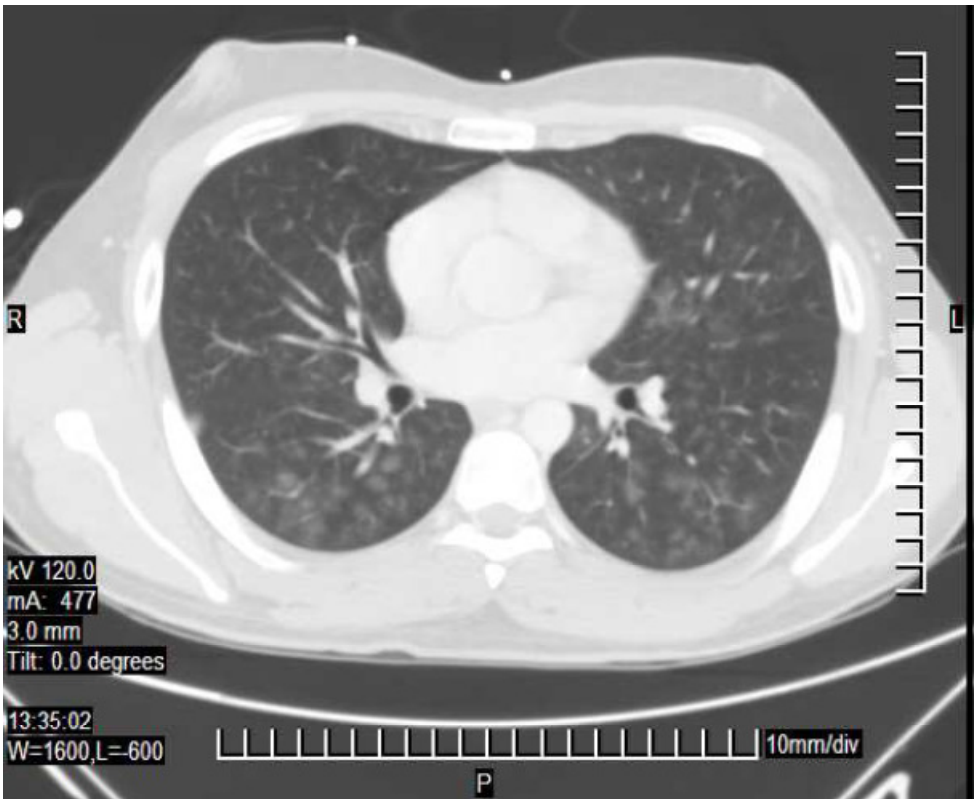

Fig 1: Diffuse micronodular/alveolar opacities.

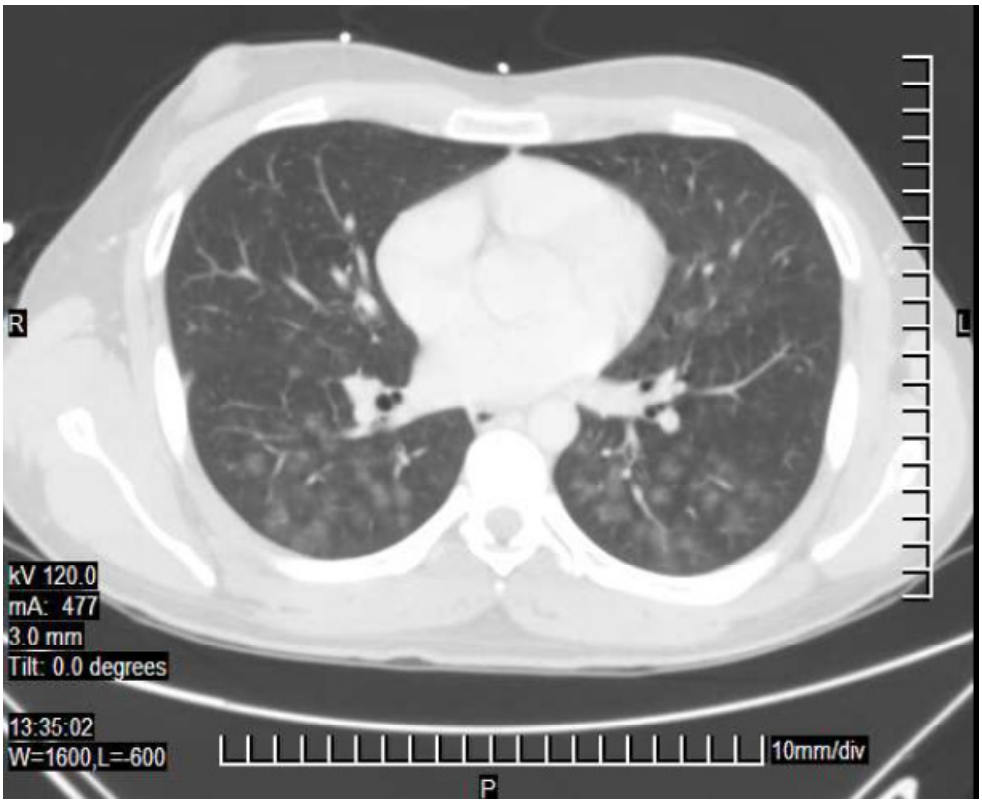

Fig 2: Diffuse micronodular/alveolar opacities.

Fig 3: Diffuse micronodular/alveolar opacities.

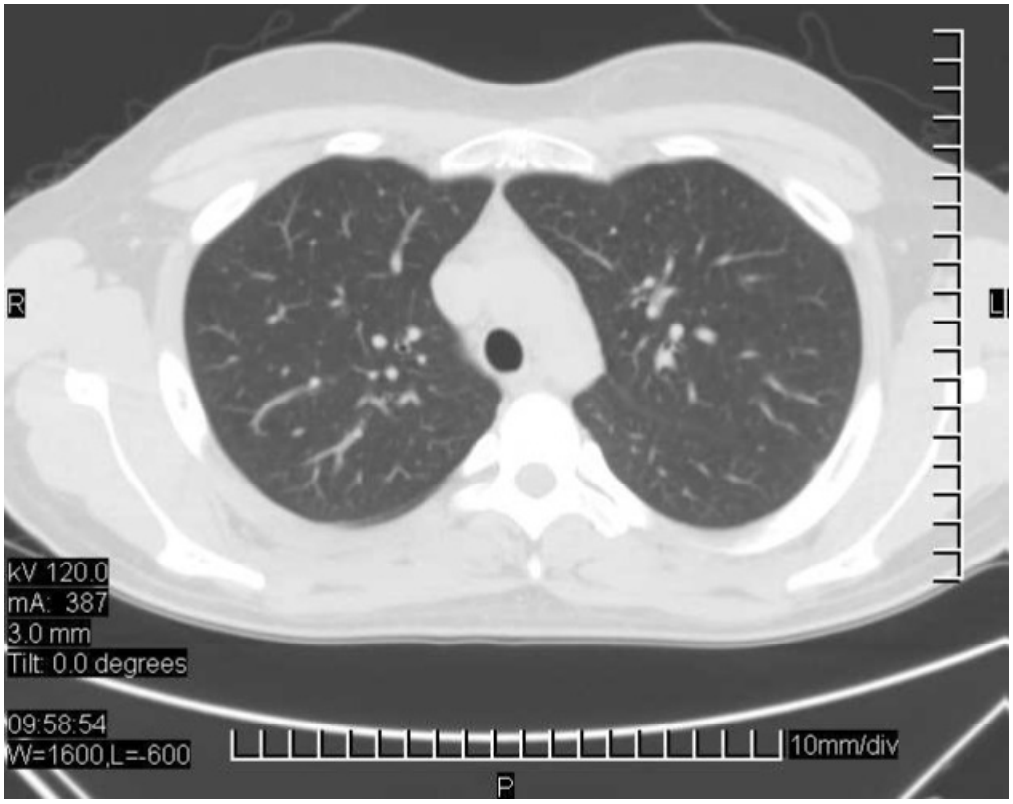

Fig 4: Complete clearance of the micronodular/alveolar opacities.

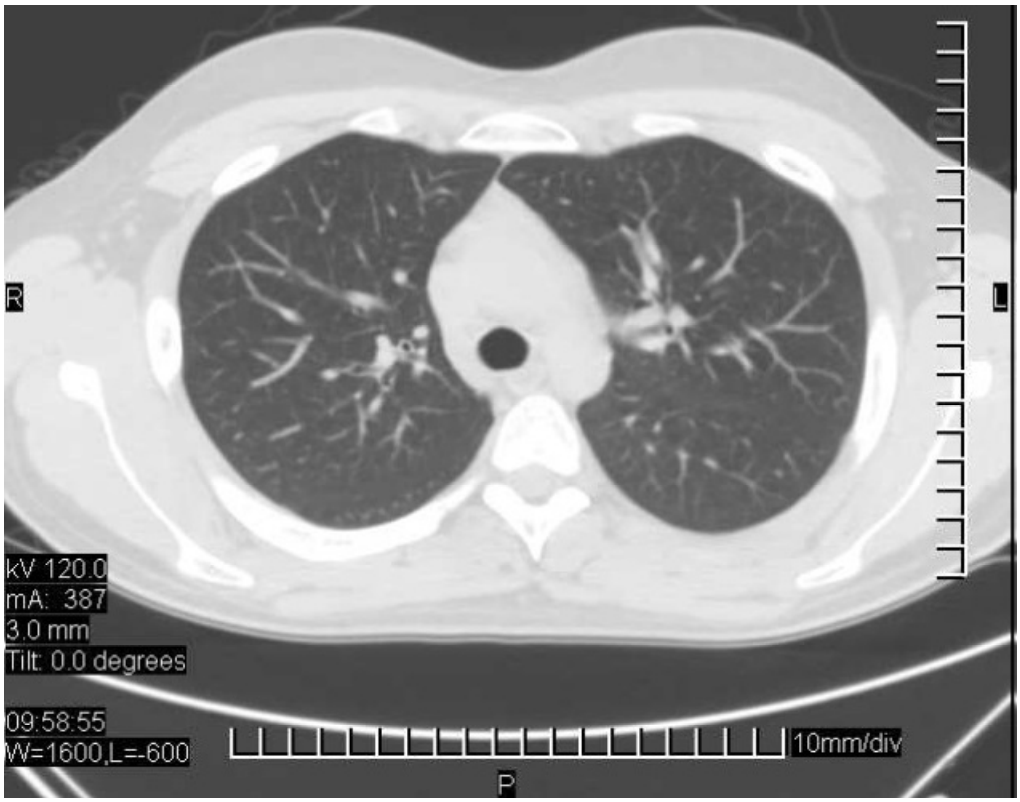

Fig 5: Complete clearance of the micronodular/alveolar opacities.

Truth telling: Do different cultures require different attitudes?

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Health care professionals who are dealing with cancer are in a dilemma of whether to tell the truth to the patient or not. In clinical practice the issues include not only 'whether' but 'when', 'how' and 'how much' to tell patients about their diagnosis, treatment choices and possible prognosis. These questions have troubled doctors very much especially when they try to follow the principle of 'doing good' to their patients. Some people agree that patients have the right to be well informed and to practice their autonomy of making decision for themselves about medical care. Nevertheless, a commitment toward openness has not been achieved and is not suitable for every culture. A common reason for hiding the truth is the intention to protect affected persons from being harmed by knowing.

In North America and Western countries, clinicians' attitudes towards telling cancer patients about their diagnosis have changed remarkably in the past few decades. There has been a major shift in medical culture from an attitude of medical paternalism (doctors know best and can act in the way they believe to be in the patient's best interest), to one in which patient autonomy and informed participation in medical decisions is the predominant value. This shift is reflected in the greater willingness of doctors to disclose and to discuss cancer conditions with their patients. The survey by Oken [1] in 1961 of 219 clinicians in the United States found that 90% would not disclose a diagnosis of cancer to a patient. A repeated survey of 264 American clinicians using the same questionnaire in 1979 found that 97% would inform the patient of a diagnosis of cancer [2].

In the above countries, principles of informed consent and patient autonomy have created clear ethical and legal obligations to provide patients with as much information as they desire about their illness and potential treatment. Clinicians may not withhold medical information even if they suspect it will have a negative effect on the patient. Yet a mandate to disclose the truth, without regard or consideration for the sensitivity with which it is done or the obligation to support the patients and assist them in decision-making can result in the patients being upset as much as if they were lied to.

The disclosure of a cancer diagnosis and prognosis has been an important but still unresolved issue in cancer management and care in the Middle East and other parts of the world like the Far East, Southern Europe and South America. Doctors in these countries usually do *not* inform patients about either the diagnosis or the prognosis of cancer, although changes towards more disclosure have been reported from Japan recently. Cultural, social, ethical and religious concerns are believed to play important roles. In contrast to Western cultures, which adhere to more individually

orientated philosophies, traditional cultures place more value on the collective role of family in decision making. Discussion is more likely to take place with family members, who then filter the information that the patient receives.
Some of the reasons for not telling the truth about cancer are (1) worry that patients could not take the emotional impact, (2) worry about doctors not being able to manage the patients' emotional reaction after learning the truth, (3) protecting patients from harm and (4) taboo about discussing death and related issues

Cultures in the West hold that most people are capable of making properly informed decisions about medical issues and it is usual for competent adult patients to control what information family members are given. The universal application of this disclosure model, based on very western ideas of autonomy, has raised concerns for some. In some cultures, an adequate understanding of medical data is beyond most people. To force a person to make independent choices, where he/she is socio-culturally unprepared to do so, may challenge their ability to take such decisions. This may, in turn, jeopardize the respect, integrity and human worth the principle of autonomy was meant to ensure. Western disclosure practices may make the relationship between patients and health care workers difficult and even distrustful.
Because of advances in cancer treatment in the West, telling about a cancer diagnosis is no longer equal to announcing certain and imminent death. This does not necessarily apply to other parts of the world, as there appears to be particular problems passing on information to patients in resource-poor countries. An important consideration is what medical services a patient has access to. If the health professional assesses that the treatment is not available or the patient cannot afford a potentially useful therapy, the doctor must consider whether patients will derive greater benefit or greater suffering from being told about it.
The educational level of the patient is a significant factor in whether or not he/she is aware of his/her cancer. This correlation perhaps relates to the empowering effect of education to encourage questioning the health care professionals. Another interpretation might be that it is easier to hide the diagnosis from patients if they are uneducated.
What will happen if we continuously withhold the truth from the patient?
First, patient compliance is needed to ensure treatment efficacy and it goes without saying that patients can not fully comply with their treatment if they are not aware of the diagnosis. *Second,* patients will never have a chance to make choices about their medical treatment and care. *Third*, with limited conversations and interactions, patients may feel isolated or even being abandoned. They may have sensed their physical decline and felt distressed of the disease but could not share their fears and anxieties with others. *Fourth*, it will be impossible for patients to sort out their will and fulfil their expectations before they die. *Finally*, there will be a serious problem of trust, which will challenge the relationship between health care professionals and patients. Patients will probably either be suspicious or fully aware that people "lied" to them. They may choose to pretend they do not know in compliance with the family's wishes. They will have more stress from the kind intentions of their families than if they had been told truthfully.
In a survey done in Lebanon [3], 47% of doctors reported that they usually

disclose the truth to cancer patients (``tellers'') and 53% reported that they usually do not (``non-tellers'').
It was interesting that training abroad did not affect the disclosure policy. Doctors with U.S. training, where disclosure is considered the norm, were not more inclined to such disclosure. They believe that they had reached their current practice under the influence of their own life experience and/or personal values and convictions. Thus, regardless of what they may have been told during their formal education, those physicians seemed to be mostly influenced by trends and values predominant in the culture where they practice.

There are four recognised contexts of awareness experienced by patients with life-threatening illnesses [4]:

1. Close awareness: doctors and family try to hide the truth and engage in conversations that avoid disclosure. They keep conversations to the minimum and steer away from talking about the future, especially when a patient is in a very advanced stage of cancer. Nevertheless, the patient may move to either suspicion awareness or to full awareness of their diagnosis at a later stage.

2. Suspicion awareness: is a situation where patient begins to suspect the seriousness of their condition. The patient may attempt to confirm their suspicion by direct or indirect measure, such as sneaking a look at medical records, making direct requests of the staff or family, and inducing families and staff to adopt different strategies in response. As a result, the relationships between patient, staff and their families are strained.

3. Mutual pretence: at a later time, when staff, families and patients themselves all know that the patient is dying, but choose to pretend that the patient is going to be all right. The drama between them could last for a long time; and as a consequence the patient will die without ever knowing the truth from family or staff, although they may have full awareness of their condition.

4. Open awareness: open awareness results from when staff, families and patients know and choose to acknowledge in their actions that the patient is seriously ill.

The biggest challenge for doctors facing patients with cancer is how to break bad news and not to devastate the patient. The skills of communication and interaction with these patients are most important for health care professionals who carry out the mission of truth telling. A careless telling may cause more damage, which is against the principle of do not harm. The bearer of bad news often experiences strong emotions such as anxiety, a burden of responsibility for the news and fear of negative evaluation. This stress creates a reluctance to deliver bad news. When clinicians are uncomfortable in giving bad news they may avoid discussing distressing information, such as a poor prognosis, or convey unwarranted optimism to the patient. A plan for the way of disclosing bad news can increase physician confidence in the task of delivering unfavourable medical information.
The authors of several papers [5, 6, 7] have advised that interviews about breaking bad news should include a number of key communication techniques that facilitate the flow of information and alleviate the impact these news may have on patients. The process of disclosing bad news can be viewed as an attempt to achieve

four essential goals. The first is gathering information from the patient. This allows the clinician to determine the patient's knowledge and expectations and readiness to hear the news. The second goal is to provide intelligible information in accordance with the patient's needs and desires. The third goal is to support the patient by employing skills to reduce the emotional impact and isolation experienced by the recipient of bad news. The final goal is to develop a strategy in the form of a treatment plan with the input and cooperation of the patient.

STEP 1: Setting up the Interview

Mental rehearsal is a useful way for preparing for stressful tasks. This can be accomplished by reviewing the plan for telling the patient and how one will respond to patients' emotional reactions or difficult questions. As the messenger of bad news, one should expect to have negative feelings and to feel anxious and responsible. It is helpful to be reminded that, although bad news may be very sad for the patients, the information may be important in allowing them to plan for the future.

STEP 2: Assessing the patient's perception

Steps 2 follows the role "before you tell, ask." That is, before discussing the medical findings, the clinician uses open-ended questions to create a reasonably accurate picture of how the patient perceives the medical situation. For example, "What have you been told about your medical situation so far?" or "What is your understanding of the reasons we did the scan?". Based on this information you can correct misinformation and tailor the bad news to what the patient understands. It can also accomplish the important task of determining if the patient is engaging in any illness denial, wishful thinking or unrealistic expectations of treatment.

STEP 3: Giving knowledge and information to the patient

Warning the patient that bad news is coming may lessen the shock that can follow the disclosure and may facilitate information processing. Examples of phrases that can be used include, "Unfortunately I've got some bad news to tell you" or "I'm sorry to tell you that…".

Giving medical facts may be improved by a few simple tips.

First, start at the level of comprehension and vocabulary of the patient. Second, try to use nontechnical words such as "spread" instead of "metastasized" and "sample of tissue" instead of "biopsy." Third, avoid excessive bluntness (e.g., "You have very bad cancer and unless you get treatment immediately you are going to die") as it is likely to leave the patient isolated and angry, with a tendency to blame the messenger for the bad news. Fourth, give information in small chunks and check periodically his/her understanding. Lastly, when the prognosis is poor, avoid using phrases such as "There is nothing more we can do for you"

STEP 4: Strategy and summary

Patients who have a clear plan for the future are less likely to feel anxious and uncertain. Also sharing responsibility for decision-making with the patient may also reduce any sense of failure on the part of the physician when treatment is not successful. Checking the patient's misunderstanding of the discussion can prevent the tendency of patients to overestimate the efficacy or misunderstand the purpose of treatment.

Conclusion:

What is needed from doctors is a consideration of each patient's situation and needs, an appropriate prioritising of ethical and cultural principles and the selection of effective methods for achieving these.
Clinicians who are convinced that communicating the diagnosis of cancer is beneficial should inform patients who ask to be told and even those who would have preferred not to know about their diagnosis.
In societies where important personal decisions are left to senior family members, it may be inappropriate to inform just the patient. In fact, in clinical settings where family members are continuously present, it may not even be possible. There may be a very important role for family members to play in providing the necessary support for their patients provided that there are given the appropriate guidance by the care professionals.

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