Prevalence of diabetes mellitus and hypertension in relation to chemical composition of drinking water: Does magnesium protect against diabetes mellitus?

Sir,

I have read with interest the article written by Dr Mahaba which was recently published in the Saudi Medical Journal. This paper raised a public health issue regarding drinking water deficient in magnesium and suggested an etiological link with diabetes mellitus. I would like to comment on four points: definition of the variables, design, analysis, and the interpretation of the data.

Definitions. It was stated in the article that: "for random blood glucose - values >7.8 mmol/L are regarded as suspected cases, and are referred". This definition is unknown; the WHO definition states that someone is diabetic if fasting (not random) plasma glucose >7.8 mmol/L or 2 hours following ingestion of 75g oral dextrose, plasma glucose >11.1mmol/L, better still is what has more recently been found by testing for HbA1c. The study did not state how many diabetes mellitus cases were in primary health care centres. It is unclear what the author meant by the word population; does he mean the denominator i.e., people living in Hail or the patients who were studied in the cross-sectional study of this paper?

Design. The study lacks the ability to control for the effects of potential confounding factors such as sex, weight and race particularly Asian who have higher rates of diabetes mellitus. We do not know the total number of foreign workers in the region nor the socio-economic classes of the population who attend these clinics. The question about heterogeneity of the population was, thus not addressed. If many people consider drinking fizzy drinks and bottled water as the main source of drinking water - as I believe it is the case - would that not upset the design of the study? Furthermore, it is well known that the temporal relation and the dose-response relationship between exposure and the outcome can not be determined in a cross-sectional study.

Analysis. The details necessary to replicate the calculations were not provided. The sample size and statistical power were not stated and confidence interval (CI) was not mentioned. A graph of the correlation would have been clearer than the tables. The use of percentile is not helpful, age groups can give better indications of the prevalence with age.

Interpretation. The author did not propose or even mention an explanation on how the water contents differ in the same Region of Hail. The study shows statistically different levels of Mg in different parts of the region in drinking water, however, the study did not show how to correlate clinically as opposed to statistically with the outcome in those individuals. No account was made for the undiagnosed diabetes. It is estimated that in 50% of persons with diabetes in the United States, diabetes is undiagnosed and I would expect at least a similar proportion to be found elsewhere, accordingly, any observed association between diabetes mellitus and low level of magnesium in drinking water would thus be seriously distorted.

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Reply from Author

I have read the valuable comments of Dr. Y. Adi and I would like to explain the mentioned points.

Definitions. The random blood glucose level of >7.8 mmol/L was used as a screening test for diabetes. Diagnosis was made according to the WHO criteria and was the responsibility of hospital physicians after referral of suspected cases.

All cases of diabetes mellitus in this study were those registered at all PHCC’s at Hail region, during the study period and the population, the denominator was the population at the catchment area for each PHC. Each PHC has continuously updated registers for its population.

Design and analysis. In this ecological study the sampling unit was the catchment area for each PHC. All PHCC’s were included. Comparison between areas with high and low prevalence of diabetes and hypertension as regards to chemical constituents of drinking water was carried out. Percentile distribution was a fair method to divide the studied areas into those with high and low prevalence of diabetes and hypertension.

All PHCCs were included in the study so calculation of sample size, power and confidence interval were not needed.

Interpretation. The difference in chemical constituents of drinking water differ due to difference
in dissolved salts from the soil. Hail region has a very wide surface area and its soil differs in different areas.  

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References  

Sildenafil (Viagra™): A breakthrough in the management of an old problem or a risky drug  

“Impotence”, a term commonly used amongst the lay masses and less educated people brings in its wake disastrous psychological and family problems. As the term impotence invariably heralds an end to masculine powers and manly ego, experts in linguistics and phraseology have coined the word “erectile dysfunction” to evade the most hated and distressing nomenclature of impotence while referring to these ill-fated individuals suffering from erectile dysfunction. Although the word “erectile dysfunction” sounds less haunting, reasonably appealing and devoid of the much talked about social stigma associated with its name, nevertheless, it also entails the same psycho-somatic suffering as impotence.  

Erectile dysfunction is perhaps one of the most terrifying and ugliest endowments of the aging process. Young age embodies gifts such as beauty, moistened skin, dark hairs, glistening white teeth, elegant stature supported by an erect and composed spine and above all a graceful walk and a lightening memory. Naturally the first score years of human life are perhaps the best years of one’s life when the entire body presents a spectacular grace and heavenly grandeur. William Wordsworth, the famous English poet refers to this period nostalgically and says, “Now of my three score years and ten, twenty will not come again.” We agree that man’s strongest instinct and desire has been sex and this is well elucidated by the report that since its launch in the United States in March, Viagra has become the fastest selling drug ever. However we have to be aware of the famous maxim that “all that shines is not gold”. There have been 69 deaths associated with Sildenafil reported by the Food and Drug Administration in the United States since its launch there in March. It is an astronomical figure specially with a drug that has gained world wide publicity. Other similar deaths must have occurred elsewhere on the planet to which the clinicians and research workers are oblivious because it seems the drug is traded in black market and consumed by all and sundry. To appease their innate and strongest desire of sex, people seem ready to procure the magic drug by whatever means available to unfold a magic phenomenon in their sexual drive.  

A 50 mg tablet costs $7.8 in Europe as against $7.5 in the United States. This exorbitant price is certainly beyond the reach of the middle and lower class. The question is not as to who can afford it but the basic problem is how to be sure that it is being rightly dispensed.  

Unlicensed procurement without a thorough screening and without a Consultant’s advice has to be checked because logically it certainly might prove catastrophic in young adults with undiagnosed aortic or mitral stenosis. Normally these individuals experience erectile dysfunction stemming mainly from the fear and anxiety associated with their underlying disease. A kick to boost their sexual life under their precarious hemodynamic state can prove to be devastating. In our opinion, more skill sessions and extensive research is needed to arrive at concrete guidelines regarding the fate of Viagra.  

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