

Metabolic syndrome in Saudi Arabia

To the Editor

I have read with great interest the recently published study by Al-Nozha et al¹ on which they should be congratulated. However, I have some important issues to raise.

Firstly, I have noticed the significant association between urban residence and metabolic syndrome (MS) in their study and I wonder if the authors have also established this association for every and each component of MS. Our data in Oman concludes that living in urban areas seemed to increase the risk of clustering of cardiovascular risk factors.² Although our data did not prove any significant association between urban residence and hypertension among females, total impaired fasting glucose, hypercholesteremia, or central obesity, clustering of 2 or more of these factors was significantly associated with it. The answer of the question raised from our data "how could urban lifestyle affect certain cardiovascular risk factors as obesity, hypertension among males or aggregation of risk factors and spare others as diabetes, central obesity and hypercholesteremia?" is not clear to us. Perhaps neglecting the measurement of psychosocial factors and emotional stresses, which could partly explain urban-rural differences in cardiovascular risk in our study as well as Al-Nozha et al¹ study could be considered one of its limitation.

Secondly, I wish also to refer to some trivial errors in their manuscript. In table 3, the odds ratio (OR) of male versus female sex (or vice versa) is confusing the reader. It should be only one OR for any binary variable in logistic regression, as it was for residence. Unfortunately, the authors skipped the comment on table 3 in the results' text. Also, in discussion, the authors were not accurate by stating that "6.7% of patients with coronary artery disease (CAD) were found to have the MS, compared to 4.6% without the MS". It would be less ambiguous if stated as follows: 6.7% of those having MS were found to have CAD, whereas only 4.6% of those without MS had CAD. Besides, the authors did not mention any clue to the criteria of diagnosing CAD in the methods of their study. Implicitly, I could hardly understand that this study is related to Al-Nozha et al³ published in 2004 by summing up the prevalence of CAD among those with and without MS to have the overall CAD prevalence of 5.5%.

Thirdly, the authors also stated in the results' text that "lower income level in urban subjects shows the high prevalence of MS, while among rural subjects a high income level shows a higher prevalence of MS".

Looking to table 2, the reader could easily find that the authors contradicted themselves as the difference in MS prevalence according to the income level in the rural strata was not significant; $p=0.122$. Moreover, the results of logistic regression proved the association of higher income with high MS prevalence controlled for other confounders in the model as age, and residence. So, the authors' statement that "other variables such as marital status....., and income level are not showing consistency to draw conclusion probably because of the confounders' effect particularly, increasing age" was inaccurate. Conversely, if a variable was shown significant in the logistic model it means that there is a real association because of being controlled or adjusted for other variables with it in the model.

Fourthly, the authors compared their MS prevalence with that in Indian and Greek studies. They admitted that the waist circumference was modified in the Indian study and I wonder if it was also modified in the European study. Cooppan⁴ discussed that in his recently published paper. He mentioned that part of the problem with the National Cholesterol Education Program definition of obesity is that the cutoff points used to define obesity in both men and women are not valid for people from Europe and Asia. He added that Asians have a lower body mass index (BMI) and waist circumference but can still have insulin resistance. Because of this ongoing debate and lack of consensus, the World Health Organization (WHO) recently modified the BMI cutoff for obesity in Asians to greater than 23 kg/m².⁵ The International Diabetes Federation (IDF) recently published consensus cutoff points for waist circumference that are more ethnic specific and acknowledged that more data is needed to link these levels to risk. For the Middle Eastern (Arab) the IDF recommends using the European cutoff levels until more specific data are available.⁶ Cooppan⁴ recommended that the federation's cutoff levels should be used until further data are available.⁴

Finally, the authors mentioned in their discussion that the "health hazards associated with the MS is not limited to CAD, diabetes mellitus and hypertension" Actually, all the other diseases the authors mentioned are associated to insulin resistance not MS. As the insulin sensitivity can vary widely in a population, the degree of insulin resistance can also vary between tissues and leads to different clinical presentations of the insulin resistance syndrome. Presentations include MS, polycystic ovary disease, and non-alcoholic fatty liver disease.⁴

Mustafa M. Afifi
Ministry of Health
Muscat
Sultanate of Oman

Reply from the Author

We thank Dr. Afifi for his interest in our article "Metabolic Syndrome in Saudi Arabia".¹ We agree that in table 3, row 10, there is an extra line under Variable gender (Female 0.049 0.23 0.894) that is typing error, which was overlooked by our Statistician and that line should have been deleted. Similarly, the statement for CAD association with MS is clearly stated in the abstract section, while in the discussion it is supposed to read as follows "6.7% of patients with MS were found to have CAD, compared to 4.6% without the MS".

However, other issues raised by Dr. Afifi may not reflect correct interpretations. For instance, although the difference in prevalence of MS categorized by income did not reach statistical significance, however, we did not use the term significant. Moreover, the reader can easily detect a clear difference of 5% among urban population (lowest and highest prevalence), and a difference of 17% among rural population, that is clearly different but did not reach statistical significance. Furthermore, the variables for logistic regression did not compare all marital status to control for confounders effect, as it only compared married versus single, divorced versus single, and widowed versus single, but not married versus divorced or widowed versus married and that was similar in comparison for income level, and hence, no unequivocal conclusion could be made based on our data regarding this point.

Our article "Metabolic Syndrome in Saudi Arabia", clearly states in the introduction section "Among various names given to this syndrome (including the metabolic syndrome, the insulin resistance syndrome, the plurimetabolic syndrome, and the deadly quartet), "insulin resistance syndrome" has been commonly used". We hope that the above clarifications will clear the confusion, and we further thank Dr. Afifi for his constructive comments on our study.

Mansour Al-Nozha
Taibah University
Madinah Munawwarah
Kingdom of Saudi Arabia

References

1. Al-Nozha MM, Al-Khadra A, Arafah MR, Al-Maatouq MA, Khalil MZ, Khan NB, et al. Metabolic syndrome in Saudi Arabia. *Saudi Med J* 2005; 26: 1918-1925.
2. Al-Riyami, Afifi M. Clustering of Cardiovascular Risk Factors Among Omani Adults. *East Mediterr Health J* 2004; 9: 893-903.
3. Al-Nozha MM, Arafah MR, Al-Mazrou YY, Al-Maatouq MA, Khan NB, Khalil MZ, et al. Coronary artery disease in Saudi Arabia. *Saudi Med J* 2004; 25: 1165-1171.
4. Cooppan R. Metabolic syndrome and its evolving link to diabetes. *Postgraduate Medicine* 2005;118: 7-10.
5. WHO Expert Consultation. Appropriate body mass index for the Asian populations and its implications for policy and intervention strategies. *Lancet* 2004; 363: 157-163 [Erratum, *Lancet* 2004; 363: 902].
6. International Diabetes Federation. Rationale for new IDF worldwide definition of metabolic syndrome. (cited 7 Sept. 2005). Available from URL:http://idf.org/webdata/docs/metabolic_syndrome_rationale.pdf