Accuracy of clinical diagnosis versus echocardiography in evaluating heart murmurs. *How to measure accuracy?*

To the Editor

I have read with interest the recently published article by Dr. Subhi in your prestigious journal.[1] I have some comments to raise due to the importance of the subject. First, in the results section (p. 673, column 1, line 6 before the end) the author erred when mentioned that "both diagnoses were concordant in 50 patients and dis-concordant in the remaining 56". The correct numbers should be 56 and 51 respectively (as in Table 4). Second, it was clear how the concordant diagnoses summed to 56 (50 pathological and 6 normal cases concordant in clinical and echocardiography examination). It was also clear how the dis-concordant diagnoses summed to 51 (34 cases normal by echo but pathological by clinical diagnosis, 11 pathological cases misdiagnosed clinically, and 6 clinically normal cases found pathological by echo). Yet, the dis-aggregation of the dis-concordant cases is not clear to the reader, probably inaccurate, and definitely inconsistent with Table 3. Third, the author used Chi squared test to conclude that "such difference was of highly statistical difference". I wonder what difference the author referred to. Chi squared test is a weak statistical measurement of association and it is unsuitable to test accuracy of clinical diagnosis versus echocardiography in evaluating heart murmurs. Accuracy should be measured by Kappa statistics of agreement. Kappa summarizes in a single number the clinical utility of clinical diagnosis versus the gold standard (echocardiography) independent of sensitivity and specificity. Kappa ranges from 0 (pure chance agreement) to 1 (perfect agreement beyond chance). For clinical purposes, Kappa >0.6 is substantial and clinically useful, whereas Kappa >0.8 signifies perfect clinical utility. Finally, I would like to suggest to the author to re-analyze his data by aggregating all cases together and to examine the Kappa agreement between the clinical and echo diagnosis. Moreover, he could subgroup the cases based on the type of murmur (systolic and diastolic, or functional and organic). He could also stratify all cases according to their age or years of experience of their examiners. Then, he could test whether the accuracy of clinical diagnosis is higher among older children or among experienced pediatricians by assessing the differences between Kappa(s) using Fleiss' test.[2-4]

Mustafa Afifi
Department of Non Communicable Diseases Control, Ministry of Health
Muscat, Sultanate of Oman

Reply from the Author

No reply was received from the Author.

References

1. Subhi MD. Diagnostic accuracy of clinical diagnosis versus echocardiography in evaluating heart murmurs in Iraqi Children. ***Saudi Med J*** 2006; 27: 672-675.
2. Niwa Science [homepage on the internet] New Zealand. Cohen's Kappa. c. 2006 [cited 27 May 2006] Available from: http://www.niwascience.co.nz/services/statistical/kapparesults
3. Le Coefficient Kappa. Mai 2001: Calculez le Kappa multi-juges avec le programme "Fleiss" [cited 4 December 2006] URL: http://www.kappa.chez-alice.fr/
4. Belmont JM, Mattioli LF. Accuracy of analog telephonic stethoscopy for pediatric tele-cardiology. ***Pediatrics*** 2003; 112: 780-786.