PREDICTIVE VALUES OF "RECALL HISTORY OF CHICKEN POX" AS A RELIABLE MEASURE OF ACTUAL IMMUNITY TO THE DISEASE

Sir,

An interesting article titled "Seroprevalence of Varicella Zoster Virus (VZV) Infections in Colombo District, Sri Lanka" published in 2007[1] in your journal discussed a highly important topic in the Sri Lankan as well as regional settings. The authors have studied the age-specific seroprevalence rates of VZV infections in Colombo and discussed the value of recall history of chicken pox as a reliable measure of actual immunity to the disease. This paper was informative for those who are engaged in infectious disease control programs in Sri Lanka.

However, in the methodology and results, there was some information missing and errors in analysis. The purpose of the present paper is to discuss this missing information and basic epidemiological misinterpretation of positive predictive value, which could be helpful for other authors as well.

First, in the methodology authors have stated that they used Spearman's correlation coefficient (r_s) to determine the rise in VZV IgG seroprevalence with age. In the results, age specific seroprevalences were presented, but the r_s was not calculated. Assuming that the correlation is linear, the calculated r_s value for the reported data (Table 1 of that article) should be 0.983, which is significant for an alpha error level of 0.01. This tells us that in this particular study sample, increasing age was highly correlated with the seroprevalence of VZV antibodies.

The second observation was the error made in calculating the positive predictive value. By definition, positive predictive value is "the probability that a person actually has the disease given that he or she tests positive".[2] In the paper under discussion, the disease was represented by VZV ELISA positives (as the gold standard) and the test was represented by "recalled history of chicken pox". According to this definition, the positive predictive value (PPV) of the recalled history of chicken pox should be calculated by using following formula.

(PPV)= VZV positives among persons with a positive recalled history/ All persons with a positive recalled history

When the results are applied to the above formula, the resulting positive predictive value is only 72% (252/350). In the paper, it was reported as 76.1%, which was actually the sensitivity of recalled history to detect VZV positives.

The way the authors presented the results in the table may possibly account for this error. In Table 2 of the article, recalled history of chicken pox (the test results) was presented in columns and VZV status (the disease) was presented in rows. However, it is customary to include disease status in columns and test results in rows, when evaluating test properties. If the calculation of PPV was done using the commonly used formula (a/a+b), in this rotated table, it would provide values for the sensitivity rather than PPV for the same formula.

In conclusion, it is always better to use formulas based on epidemiological definitions, rather than arbitrary notations, to avoid these kinds of basic errors.

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