

Efficiency Analysis of Toxoplasmosis Screening in Pregnancy: Comment

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Dear Sir,

Recently an interesting Finnish article was published in this journal, advocating financial reasons for introducing nationwide serological screening for toxoplasmosis during pregnancy (1). In this paper the authors complain that, so far, no comparable cost-benefit analysis has been published from Austria, which has now had an obligatory screening system for 20 years. However, the proposed Finnish screening system is hardly comparable to the Austrian one because of differences in basic epidemiological data and in the course of procedure. Nevertheless, there are common points concerning the benefits and failures of any screening system. In particular, the arguments used for a recommendation may be similar. In the following the problematic nature of any financial argument will be elucidated in more detail.

The most striking difference between the systems is procedural. The proposed Finnish system is based on a single serum assay (avidity test), which in the case of seronegativity is performed 3 times during pregnancy plus once at delivery. In Austria, laboratories search for seroconversions by means of a 'basic test' (IIFT or SFT) 3 times during pregnancy (2). The epidemiological data differ between Austria and Finland, e.g. the percentage of seropositivity in pregnant women is 37% versus 20.3%, and the annual incidence of primary infections is 0.83% versus 0.24%. Furthermore, in Austria it is assumed that 'an adequate chemotherapy prevents transplacental infection' (2).

In common are problems such as one may optimistically presume a correlation (correct positive and negative results) of the basic antibody detection test (the avidity test in Finland and the IIFT in Austria) of 99% with the real infection stage. This means that at the first testing 1% of results are false. Now, one may argue that the false-positive results are detected during confirmative testing on the one hand, and that the false-negative results (to simplify matters, 50% of all false results) on the other hand are detected at the second testing. Assuming a constant infection risk during the whole pregnancy, both screening systems fail to identify between 0.1 and 0.3% of all primary infections due to non-detected seroconversions at the end of the surveillance period. The costs of this innate error in the system have never been calculated or included in any cost-benefit analysis.

Furthermore, the authors emphasize that by combining several different serotests the correlation of the diagnostic procedure for the detection of an acute infection may be increased up to 99.98%. The criteria for excluding certain pregnant women from such an excellent diagnostic procedure have, however, not been specified.

Thus, data on the frequency of the application of this procedure and on the resulting, possibly enormous, costs are missing. But, even if this correlation rate may be reached in some specialized laboratories, the procedure will misdiagnose about 1 primary infection per 10,000 pregnancies. Referring to the number of deliveries in Finland, and somewhat simplified, this means 3.5 pregnant women needlessly alarmed and 3.5 non-detected primary infections per year.

So, about 2 infected, but not in time detected children may be born in Finland as well as in Austria per year, although an obligatory screening system has been properly administered. We have to state that a screening system is a tool for reducing the number of children congenitally infected with the parasite and reducing the health damage as sequela of congenital toxoplasmosis, but it cannot eradicate the disease. Dealing fairly, the follow-up costs of the failure have to be included in any cost-benefit analysis. Moreover, the financial efficiency of an implemented screening system can quickly become negative due to previously uncalculated costs caused by the forgotten human factor (e.g. false decisions, nonchalance and thoughtlessness).

However, having pointed out these shortcomings, there is a serious psychological problem in an argument based on financial benefits: How can we convince politicians, physicians and women of the advantages of screening if we have to confess that all the money spent cannot prevent single cases of prenatal toxoplasma infections. Thus a cost-benefit analysis of a toxoplasmosis screening system may lead to a deceptive line of argument and turn out to be counterproductive. In my opinion, the most cogent argument for performing toxoplasmosis screening in a rich European country is rarely presented sufficiently: what is the price of saving a single human from abortion or from a life-long disability?

REFERENCES

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