Turkish Journal of Medical Sciences

Turkish Journal

of

Medical Sciences

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Development of a Diagnostic and Screening Elisa System for Measuring Tetanus Antitoxoid Levels

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Abstract: Tetanus is a vaccine-preventable disease of global importance. When acquired it has a high mortality rate. Screenings of special subpopulations such as women of childbearing age provide important clues about tetanus vaccination coverage, and tools for mass protective measures, e.g, protective measures for neonatal tetanus. In addition to its reliability and sensitivity, the main advantage of a mass-screening tool should be its cost-effectiveness. We aimed to develop a cost-effective and sensitive enzyme-linked immunosorbent assay (ELISA) that can be used for diagnostic research as well as mass screening purposes for antitetanus antibodies. Our in-house antitetanus ELISA was validated and tested for its sensitivity and specificity and then compared with a commercially available kit. The analytical sensitivity of the in-house ELISA was less than 0.008 IU/ml. For the tested concentrations the intra- and inter-assay coefficients of variation were between 0.8 and 4.1% and between 2.2 and 8.6% respectively. The results demonstrated that our in-house ELISA is quite sensitive and has a high performance with human sera similar to that of a commercial kit in determining the antitetanus antibody concentrations and may be used for diagnostic purposes as well as in mass screenings for tetanus vaccination coverage.

Key Words: Antitetanus antibodies, Tetanus toxoid, Tetanus diagnosis, ELISA

Turk J Med Sci 2003; **33**(5): 289-294.
Full text: pdf
Other articles published in the same issue: Turk J Med Sci,vol.33,iss.5.