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ENZYMEIMMUNOASSAY OF 17-HYDROXYPROGESTERONE IN DRIED BLOOD SPOT FOR SCREENING OF CONGENITAL ADRENAL HYPERPLASIA

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An enzymeimmunoassay (EIA) (Tomakomai Clinical Lab., Hokkaido, Japan) for quantitative determination of 17-hydroxyprogesterone (17-OHP) in dried blood spot collected on filter paper has been evaluated by our laboratory for screening of congenital adrenal hyperplasia (CAH). Direct analysis of 17-OHP in dried blood spot was found to be interfered by water-soluble steroids which may cause false positive screening results. Method for extracting blood samples with diethyl ether was established to improve the specificity of the test. The precision, analytical recovery and linearity of both direct and extraction methods are satisfactory. Reference range of direct and extraction methods were estimated to be 4.4-31.0 ng/mL (blood) and 1.4-7.8 ng/mL, respectively, in normal Chinese newborns. High blood 17-OHP values (>80 ng/mL) were found by both methods for the known CAH cases (3 children and a newborn at age of 6 days). 17-OHP of low birth weight newborns determined by direct method was significantly higher than those of normal birth weight newborns, but no significant difference was found when 17-OHP was analyzed by extraction method. The result indicates that the extraction method will reduce the false positive screening results and could be used as a preliminary back-up method for the simple direct EIA screening test. From 1989.5 to 1989.12, 15,694 Chinese newborns in Taiwan were screened by this EIA method. 340 (2.1%) of them were found to be positive (>30 ng/mL) by direct method. From these positive cases, only 47 (13.8%) of them had 17-OHP higher than 6 ng/mL when tested by the extraction method.