

## MASS SCREENING

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The mass screening using radioimmunoassay was started for the early detection of congenital hypo-thyroidism which we have been involved. Although other screening includes the early detection of congenital adrenal hyperplasia by measuring 17-OH-progesterone and the early detection of spina bifida by measuring alpha-feto protein, we state here our methods and results of the screening of congenital hypo-thyroidism.

Congenital hypo-thyroidism are classified to three types, namely primary(thyroidal), secondary(pituitary) and tertiary(hypothalamic) hypo-thyroidism. Among them, the most important one to cause the typical cretinism and mental retardation is the primary hypo-thyroidism, which is also more frequent than others. Early detection and treatment of congenital hypo-thyroidism is very necessary. However, because the clinical detection is difficult, mass screening by blood test became important.

Mass screening was started by measuring  $T_4$  using dried blood spot on filter paper (Guthrie's method) in 1973 by Dussault et al in Canada. We found that TSH can be measured by radioimmunoassay using dried blood spot and published in Lancet, Dec. 1975. This report is confirmed as the first report of the world, at the 1st International Symposium on Neonatal Screening, held in Heidelberg, September, 1978. When we started the screening for about 68,000 samples, probably by the method of sending samples by package, only one case was found. Then we restarted using new samples, taking TSH above 3% in each assay as abnormal, and re-tested them. If the values of TSH were above 3% again, we requested the recollection of blood and performed another assay of TSH. By these procedures, 9 cases were found among 74,505 samples by July, 1978. Among them, there included the cases, in whom TSH is high and  $T_4$  is normal. Through these experiences, it is thought that measuring TSH would be more useful than  $T_4$

measurement in detecting mild primary hypo-thyroidism.

We recently improved the method, and it was shown that TSH is measured using two of 3mm discs. Disc  $T_4$  were measured in the same samples for about 9,000 cases. Seven cases showed low  $T_4$ , and in 3 patients this was transient, 2 with TBG deficiency, one died by sepsis and one by dyspnea. No case of hypo-thyroidism was yet found by measuring  $T_4$ . It is ideal to measure both TSH and  $T_4$  if it is possible. Our future plan is to perform further the parallel assay of TSH and  $T_4$  and compare the results.