Physical and Cognitive development of Yu-Cheng Children Born after Year 1985

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This is the first report of the "Six-year Follow-up Study of Physical and Cognitive Development of Yu-cheng Children Born after Year 1985". The cohort of this study is so called "the second Taiwan Yu-cheng cohort" which was inaugurated in October, 1991. The first Taiwan Yu-cheng cohort study was commenced in September, 1985 and has been following up by the research group led by Professor Chen-chin Hsu since then. The second Yu-cheng cohort is designed to establish two cohorts of later-born Yu-cheng children: (1) 120 pairs of maternal Yu-cheng children and their matched controls; (2) 100 pairs of paternal Yu-cheng children and their matched controls to examine the hypotheses that (1) late born Yu-cheng children might have less adverse effects in their physical and cognitive development as compared with elder Yu-cheng children and their unexposed controls; (2) the positive correlation between the serum levels of PCBs/PCDFs in Yu-cheng children and their mothers/fathers.

The study period covered in this report is from October 1, 1991 to March 31, 1993 and the whole 6-year study period would last to July 1997. In the first year of this study, we have surveyed all living Yu-cheng children born to either Yu-cheng mothers or fathers after 1985 through the Domestic Registry Offices of all villages, towns and cities in Taiwan where 2061 Yu-cheng victims live. We identified 140 children born to women and 109 children born to men in the PCB registry maintained by the Department of Health, Taiwan Province. we selected 3 controls for each Yu-cheng children, matched for neighborhood, age, sex, mother's/father's age, parental educational level and occupation. We performed physical check-ups and administered cognitive developmental assessments on Yu-cheng children and one of their controls.

The main findings out of the first 2 years fieldwork were summarized as follows: compared to their matched controls, the Yu-cheng children were shorter in height by an average of 1.01 cm and lower in weight by an average of 0.97 kg

in the maternal descendents and 1.31 cm in the paternal side though they have caught up in weight. There were no differences in head circumferences, arm circumferences, thickness of subcutaneous fat tissues. Yu-cheng children were reported to have more frequent upper respiratory infections and otitis media. They were reported by their mothers to have higher activity level, but no longer have more physical, habit or behavioral problems.

On the assessment of their cognitive development, later-born maternal Yu-cheng children still scored 7 points lower on the Stanford-Binet Intelligence Test (SB-IQ) and 6-9 points lower on the verbal IQ, performance IQ, and full scale IQ of the Chinese version of the Wechsler Intelligence Scale for Children (WISC-R). The paternal Yu-cheng children performed as well as their controls on the SB-IQ and WISC-R. The maternal descendant Yu-cheng children fell significantly behind in their development on the subscales of expressive language, conceptual comprehension,, situational comprehension, self help, personal social development and gross development (p values ranged from 0.046-0.091) which assessed on the Chinese Children Development Inventory (CCDI) as compared to that of their matched controls. The preschool age development of paternal Yu-cheng children did not show differences as compared to that of their controls. Both groups of maternal and paternal Yu-cheng children did not have much difference in their temperamental profiles rated by their mothers on the Temperamental Questionnaire for Young Children as compared to their specific matched controls.

In summary, later-born maternal descendent Yu-cheng children might still have poorer cognitive development as the first Yu-cheng cohort children did[1], but the paternal Yu-cheng children have less impact in their cognitive development as they may have less prenatal exposure to heat-degraded PCBs. Later-born Yu-cheng children had a very small delay in their physical growth and suffered from minor medical problems more easily. We will continue to follow up these two groups of later-born Yu-cheng children to evaluate their course of physical and cognitive development.

Reference

[1] Chen YC, Guo YL, Hsu CC, Rogan WJ Cognitive development of Yu-Cheng ('Oil Disease') children prenatally exposed to heat-degraded PCBs. J Amer Med Asso 1992; 268:3213-8.