Nail Changes in PCB poisoning

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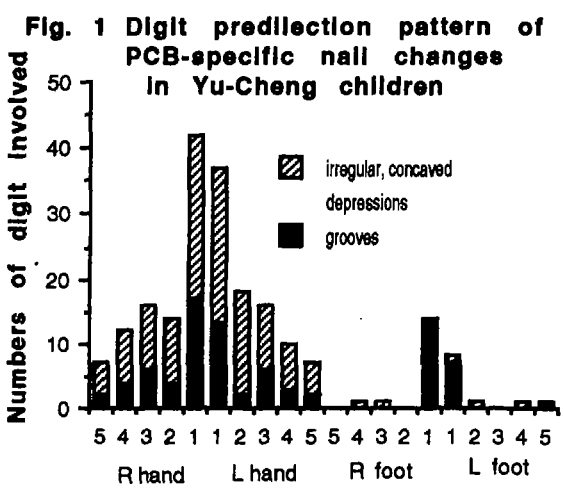
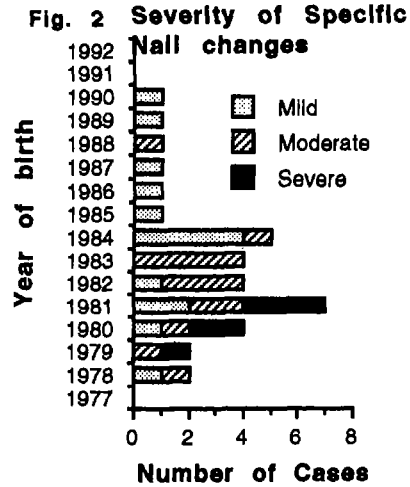
Two outbreaks of PCB poisoning due to contaminated cooking oil occurred in Japan [Yusho] and Taiwan [Yu-Cheng] in 1968 and 1979 respectively. The major early cutaneous manifestation were chloracne, pigmentation of the skin and nails[1]. Nail deformities, not observed in Yusho patients[2], were observed in some of the Yu-Cheng patients and their children born after poisoning[3,4,5]. Some of these patients have been followed periodically in the past 12 years by our groups. A recent survey revealed that in the Yu-Cheng children, chloracne and pigmentation have resolved, but some nail deformities persisted in 33% of the study group compared with only 1.2% in the well-matched control. Of the nail changes, transverse coarse grooving and irregular, concaved depression appeared more specific. In order to determine the significance of these nail changes, field surveys were conducted to compare the nail changes in 3 cohorts of PCB poisoning.

There were 3 study cohorts, one original consisting of patients poisoned by ingestion of contaminated oil and their 2 child cohorts born before and after July, 1985, respectively. The control for the original cohort were their unexposed spouses and the parents of the controls of the 2 child cohorts. The controls for the child cohorts were children matched for neighborhood, age, sex mother age and parents' combined educational level and occupation. Field surveys were conducted in 1992. Detailed nail changes including grooves, depressions, onychauxis, nail flattening, koilonychia, parallel transverse grooves or lines, pincer nails, pigmentation bands, diffuse nail plate pigmentation, small nails and nail splitting were all recorded and photographed. The severity of the changes were graded. The individual nail changes in each cohort were compared to the control and analysed by chi-square test.

There were 99 patients in the original cohort, 121 and 62 in the 1st and 2nd child cohorts, respectively. Of the nail changes, transverse coarse groovs and irregularly concaved depressions were observed in 6.1%, 25% and 9.7% in the 3 cohorts respectively, compared to the controls, these nail changes were significantly commoner only in the 2 child cohorts. Their p values were < 0.0001, and <0.01 respectively for the first and the second cohorts. Both nail changes showed a similar predilection for thumbs, followed by big toes and other fingers (Fig. 1). When some

of the children in the study groups were compared with their nail changes found one year earlier in the last survey, coarse grooving had changed into irregular depressions in some individuals. The nail changes tended to be more severe in children born closer to the time of PCB outbreak (Fig. 2).





Of the nail deformities, only coarse grooving and irregular depressions were significantly commoner in the child cohorts. This result suggests that these two nail changes may be the only significant cutaneous marker in the late stage of congenital PCB poisoning. These late nail changes were more severe in the first child cohort than in the 2nd child cohort indicating more severe poisoning in the former who were born when the maternal PCB levels were higher. Grooves and depressions of the nail appears to be the same spectrum of nail deformity as the former has been observed to change into the latter. The persistence of these nail changes in the child cases suggests possible prenatal damage of the nail matrix.

References

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