

RISK PERCEPTION AND DIOXINS IN BREAST MILK IN KOREA

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Introduction

Dioxins can enter the food chain when they are released into the environment from commercial products and other sources¹. The levels of dioxins in human sample are related to their exposure. In order to estimate the risk to humans from the exposure of dioxins in the environment, measurement of human samples are essential. Because of the lipophilic nature of milk, lactation can provide a relatively efficient mechanism for decreasing the body burden of 2,3,7,8-TCDD and related PCDDs/Fs in females. This elimination of 2,3,7,8-TCDD and related compounds through mother's milk can result in high exposure levels in the infant. High levels of 2,3,7,8-TCDD have been detected in the milk of mothers exposed to high levels of 2,3,7,8-TCDD in the environment².

The Korea Food and Drug Administration (KFDA) have entrusted the questionnaire for identification of risk perception to dioxins with the domestic dioxins monitoring in breast milk and to compare it within other nations.

Materials and Methods

This study was conducted between April 2000 and November 2000 in collaboration with Korean National Council of Women and Korea Institute of Science and Technology. In each of Seoul (urban) and Chunbuk (rural) area, about 30 mothers who were willing to cooperate, healthy and who are living in the same place of residence over the last 5 years, were included in the study. It was investigated from 39 mothers who were primiparous and 27 mothers who were multiparous and sampling of breast milk between the 5th, 30th, 60th, 100th and 150th days after birth, was done.

Questionnaire making general adult as subject on purpose of identification of relative risk perception to dioxins, was done with dioxin monitoring in breast milk. A total of 568 case questionnaire including 66 breast milk donors were collected from adult who filled in a standardized questionnaire on their individual characteristics (e.g. age, sex, tobacco consumption, education level, etc.).

The statistical analysis was performed to study risk perception related with detection of the dioxins in breast milk using SPSS³ and to identify relationship between the levels of the dioxins and individual characteristics (e.g. feeding time, residential area, delivery number) using turkey multiple test of SAS⁴.

This study has considered PCDDs/Fs and Co-PCBs as dioxins. The 17 PCDDs/Fs congeners in each individual milk sample were quantified using I-TEF (NATO)⁵ and Co-PCBs were quantified using WHO₉₈-TEF⁶.

Results and Discussion

Descriptive results

There are no statistically significant difference of dioxins levels in breast milk between the 5th, 30th, 60th, 100th and the 150th days after delivery.

This result showed that the dioxins levels in breast milk maintain equivalent level until the 150th days after delivery.

Individual data by sampling time was collected as table 1.

Table 1. Comparison of dioxins level in breast milk due to difference of residential area and delivery number

Delivery Number	Residential Area(Mean±S.D)		(pg TEQ [*] /g lipid)
	Urban Area (Seoul)	Rural Area (Chunbuk)	Mean
First	14.71±1.80	9.04±2.13	12.13±3.51
Second	8.54±1.97	8.55±1.64	8.55±1.73 ^a
Mean	11.63±1.62^b	8.77±1.81	10.26 ± 3.23

a. $p < 0.05$, first delivery vs. second delivery

b. $p < 0.05$, urban vs. rural , turkey multiple test (SAS)

* International Toxic Equivalency Factor for PCDDs/Fs and WHO₉₈ Toxic Equivalency Factor for Co-PCBs

Dioxins levels found in the breast milk were shown in Table 1. Dioxins levels in primiparous breast milk were significantly higher than multiparous breast milk.

The mean level of dioxins in total milk was 10.26 pg TEQ/g lipid, with levels ranging from 6.06 to 17.8 pg TEQ/g lipid. The mean level was lower than those from other breast milk studies conducted on small samples of women with heterogeneous characteristics two years ago.

And also, dioxins levels in breast milk of mothers living in urban area were significantly higher than rural area. This study showed that living in rural area can be much more exposed at dioxin sources. Our results regarding PCDDs/Fs and Co-PCBs were lower to those, which showed 10~35 pg TEQ/g lipid as PCDDs/Fs and PCBs, observed in the 2nd round of the WHO study⁷ conducted in different industrialized countries.

Risk perception on breast feeding

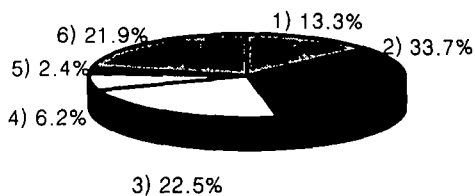
In recent years, concerning the several reports announcing detection of dioxins in breast milk, questionnaire was investigated for identification of the risk perception to the general public on breast-feeding.

About 33.7% of the general public surveyed who have known dioxins detection agreed that lactation should be encouraged because of it's benefits as immunity of breast milk rather than the risk from dioxins (Figure 1).

Practically, when the question for confirming above perception was given to mothers who have done delivery in latest 1 year, 36.1% of mothers showed answered that selected the breast feeding due to it's benefit after recognition of dioxins detection in breast milk(Figure 2).

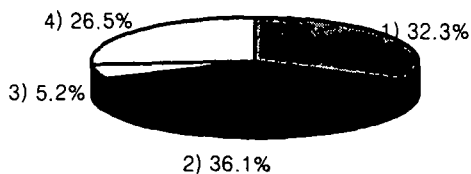
This result showed that the general public have perception which consider benefit of breast-feeding rather than the risks from dioxins.

HUMAN EXPOSURE II -POSTER



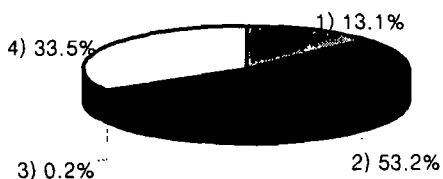
- 1) No information on the dioxins detection in breast milk (13.3%)
- 2) Agree on that the breast feeding should be much encouraged because of it's benefit than risks from dioxins (33.7%)
- 3) Disagree on breast feeding due to risks from dioxins (22.5%)
- 4) Agree on whether breast feeding or no formula feeding (6.2%)
- 5) Can not decision (2.4%)
- 6) No answer and missing (21.9%)

Figure 1. Risk perception of breast feeding of the general public related with dioxins detection in breast milk



- 1) Breast feeding unrelated to dioxins detection (32.3%)
- 2) Breast feeding due to it's benefit after recognition of dioxins detection (36.1%)
- 3) Formula feeding after recognition of dioxins detection (5.2%)
- 4) Formula feeding unrelated to dioxins detection (26.5%)

Figure 2. Risk perception of mothers who have done delivery in latest 1 year related with dioxins detection in breast milk



- 1) Only breast feeding (13.1%)
- 2) Formula feeding after breast feeding (53.2%)
- 3) Only formula feeding (0.2%)
- 4) No answer and missing (33.5%)

Figure 3. Risk perception of woman on the feeding plan in the future related with dioxins detection in breast milk

Also, when the question on the feeding plan was to woman who will be delivered of a child or has some plan of delivery in the future, about 53.2% of woman answered that will select formula feeding after breast feeding (Figure 3).

Conclusion

Dioxins mean levels as 10.26 pg TEQ/g lipid found in the breast milk of Kcrean mother regarding PCDDs/Fs and Co-PCBs were lower to those, which showed 10~35 pg TEQ/g lipid in the 2nd round of the WHO study. The general Korean public for the most part agreed that lactation should be encouraged because of it's benefit as immunity of breast milk rather than the risk from dioxins.

Reference

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