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DATA EVALUATION RECORD

TRICHLORFON

Chromosomal Aberrations in Humans

CITATION: Van Bao T, Szabo H, Ruzieska P, Czeizel A. 1974. Chromosome aberrations in patients suffering acute organic phosphate insecticide intoxication. Humangenetik 24:33-57.

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DATA EVALUATION RECORD

STUDY TYPE: Chromosomal aberrations in humans.

CITATION: Van Bao T, Szabo H, Ruzieska P, Czeizel A. 1974. Chromosome aberrations in patients suffering acute organic phosphate insecticide intoxication. Humangenetik 24:33-57.

ACCESSION NUMBER: Not available.

MRID NUMBER: Not available.

LABORATORY: National Institute of Public Health, Budapest.

TEST MATERIAL: Ditrifon-50 (trichlorfon), produced in Hungary [source and purity unspecified].

PROTOCOL:

Peripheral blood samples were taken from five patients (F=2, M=3; mean age=34 years, range=18-57), 3-6 days after "intoxication" with Ditrifon-50 by suicide attempt or "per cutan and/or inhalationem." Samples were also obtained at 1 and 6 months after exposure from surviving patients; one female died (suicide). A control group consisted of 13 healthy men and 2 healthy women (mean age=36 years, SD=11.2).

Chromosome preparations were prepared by conventional air-drying techniques (Moorhead et al., 1960. Exp. Cell Res. 20:613-616) after 48 hours of incubation (Buckton and Pike, 1964. Int. J. Radiat. Biol. 8:439-452). Metaphase plates (100/blood sample) were scored under the microscope. Among cells with modal and nonmodal chromosome numbers, chromatid-type aberrations (i.e., gaps, isogaps, chromatid breaks, isochromatid breaks and interchange) and chromosome-type aberrations (i.e., acentrics, dicentrics, and rings) were determined.

Statistical analyses were not described, however table footnotes stated Chi-square tests were conducted.

RESULTS:

The table which follows (Table 1) summarizes the data for individuals exposed to Ditrifon-50. The results of Chi-square tests were not legible in many instances [due to poor copy], however the text and legible

portions of the table stated there was a significant increase in the frequency of chromatid breaks and stable chromosome aberrations in Ditriphon-50-intoxicated persons (after 3-6 days and 1 month). One male "proved to be a Klinefelter mosaic." Data from this patient were responsible for an apparent increase in the number of hypermodal cells in exposed patients (Table 1).

CONCLUSIONS:

The number of chromatid breaks and stable chromosome aberrations was considered to be increased in humans 3-6 days and 1 month after exposure to Ditriphon-50. The results indicate a temporary (at least 1 month but not 6 months) but significant increase in these aberrations but the mechanism is not known. Because the number of individuals examined is small, the results are not conclusive but appear to indicate that Ditriphon-50 may induce chromosome aberrations in human populations.

CORE CLASSIFICATION: Unacceptable.

The following deficiencies were noted:

- o The patients were exposed to a formulated product rather than technical grade.
- o The exposure levels (dose levels) were not stated.
- o The population studied was small, and in several instances, the values for a particular parameter were less than 5. Consequently, the Chi-square values for these parameters had "no absolute validity" (stated in report).

TABLE 1. Distribution of Chromosome and Chromatid Aberrations in Persons Exposed to Ditriphon-50

	Controls	Time After Exposure			
		3-6 days	1 month	6 months	
No. of Cases Studied	15	5 (4) ^a	4 ^b (3)	4 ^b (3)	(3)
No. of Cells Analyzed	1,425	500 (400)	400 (300)	480 (380)	(380)

Nonmodal cells					
<46	54	29 (27)	27 (20)	5 (5)	(5)
>46	2	38 (2)	74 (-)	70 (- ^c)	(- ^c)
Polyploid	2	3 (3)	1 (-)	- ^c	(-)
Total	58	70 (32)	102 (20)	75 (5)	(5)
Percentage	4.1	14.0(8)	25.5 (6.7)	15.6 (1.3) ^d	(1.3) ^d

Chromatid Aberrations					
Gap	35	11	16	12	
Isogap	6	1	3	-	
Break	1	3	4	-	
Exchange	-	-	-	-	
Total	42	15	23	12	
Percentage	2.9	3.0	5.8	2.5	

Unstable Chromosome Aberrations					
Acentric	5	3	4	1	
Dicentric	-	-	1	-	
R	-	1	1	-	
Total	5	4	6	1	
Percentage	0.4	0.8	1.5	0.2	

No. Cells Karyotyped	150	51	40	41	
Stable Chromosome Aberrations					
p ⁻ or q ⁻	5	4	10	3	
t	-	2	2	-	
Total	5	6	12	3	
Percentage	3.3	11.8	30.0	7.3	

^aValues in parentheses exclude data from patient with Klinefelter mosaic.

^bOne patient died due to intoxication.

^cDashes not defined in report.

^dThis value calculated by reviewer.