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Short Communication

COMPARATIVE EVALUATION OF THE FREQUENCY OF CHROMOSOMAL ABERRATIONS AND THE SCE NUMBERS IN PERIPHERAL LYMPHOCYTES OF WORKERS OCCUPATIONALLY EXPOSED TO VINYL CHLORIDE MONOMER

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(Received 31 March 1978)
(Revision received 15 November 1978)
(Accepted 23 November 1978)

There are now available plenty of authorative data on the carcinogenic [1–3, 13] and mutagenic [1,2,10] activity of vinyl chloride monomer. Increased frequency of chromosomal aberrations detectable in peripheral lymphocytes of chronically exposed workers has been reported by numerous authors [4–6, 11,12].

We have repeatedly analysed, using routine cytogenetic techniques [8], 3 blood samples from each of 9 workers occupationally exposed for 10–27 years to relatively high mean annual doses of vinyl chloride monomer (about 20–150 ppm of air). In the third blood sample series we also used the SCE technique [14] and compared the frequency of detected chromosomal aberrations with the number of SCEs in each sample. The blood samples from 8 healthy persons were used as controls and were collected with the 3rd blood sampling from the vinyl chloride (VC) workers. The control persons were matched for age and sex and they were not exposed to known mutagens during 3 months before the time of blood collection.

The results are summarized in three tables. Tables 1 and 2 show the instability and non-homogeneity in the frequency of chromosomal aberrations over a period of two years. Mostly chromatid and chromosome breaks were detected; chromatid and chromosome exchanges occurred only sporadically.

Table 2 compares the frequency of chromosomal aberrations and the number of SCE per cell in 7 blood samples. There is an apparent increase in both parameters in comparison with control levels.

The mathematical evaluation of our results was calculated only for the 3rd collection. Conventional aberrations in VC workers were non-homogeneous.

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BLE 2

OMOSOMAL ANALYSES OF 9 WORKERS OCCUPATIONALLY EXPOSED TO VINYL CHLO-

Exposure		1st collection	2nd collection	3rd collection	
rs	ppm	aberrant cells (%) [a]	aberrant cells (%) [a]	aberrant cells (%) [a]	SCE cell [b]
25	20- 150	11	0	11 [c]	17.50 [c]
18	20- 80	1	2	2	9.56
17	15- 70	2	7	3	15.02 [c]
16	20- 150	1	1	5	
15	20- 90	0	1	7 [c]	15.26 [c]
14	20- 150	3	6	11 [c]	16.41 [c]
14	20- 90	1	4	3	10.60
13	20- 90	1	2	1	12.22 [c]
12	20- 90	4	1	3	
				5.2 ± 1.3	13.80 ± 1.13
mean)				1.8 ± 0.4	9.41 ± 0.40

were scored per sample
were scored per sample
mals increased in comparison with control values.

luced chromosomal changes depend both on dose and length of exposure to vinyl chloride monomer.

Our results seem to lead to a conclusion that the two cytogenetic methods — utine and SCE — are equally suitable for testing of high-dose vinyl chloride utagenicity in vivo. The increase of SCEs in our results is more homogeneous. he sensitivities of the two methods to detect mutagenic activity seem to be oout the same

BLE 3

DICAL HISTORY, AND SMOKING AND DRINKING HABITS OF WORKERS TESTED

	Diagnostic relation	Smoking	Drinking	Drugs
I		+	±	Meprobamat
				Papaverin
		+	++	Chloramphenicol
				Syntophyllin
K	+		+	--
H			±	Solutan
				Syntophyllin
M			+	-
		+	±	Bellaspon
			+	—
I		++	++	Superpyrin
				Thiospasmin
			+	Ketazon

TABLE 1

CHROMOSOMAL ANALYSIS OF 8 CONTROLS

	Abnormal cells [a] (%)	SCE/cell [b]	Smoking	Drinking
M.K.	3	10.88	–	
J.K.	0	8.22		
V.B.	3	10.30	++	+
J.S.	3	10.16	++	+
K.B.	1	10.46		
M.Ku.	1	8.26	–	–
Z.P.	2	7.94	±	–
R.S.	1	9.02	–	+
Mean	1.8 ± 0.4	9.41 ± 0.40		

[a] 100 cells were scored per sample

[b] 50 cells were scored per sample

The controls were not exposed to X-rays and drugs at the time of blood collection

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