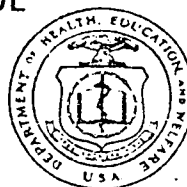


CENTER FOR DISEASE CONTROL

Morbidity
and Mortality



Vol. 24, No. 29

WEEKLY
REPORT

For
Week Ending
July 19, 1975

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE PUBLIC HEALTH SERVICE
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EPIDEMIOLOGIC NOTES AND REPORTS
VINYL CHLORIDE AND CONGENITAL
MALFORMATIONS - Ohio

In March 1975 the Ohio Department of Health reported a significantly increased rate of central nervous system (CNS) malformations in 3 Ohio communities where polyvinyl chloride (PVC) polymerization plants are located (1); the increase was not uniform and appeared most prominent in Painesville, Ohio. The birth defect rates were computed from birth certificate data for 1970-73 and were compared to similar data for the entire state of Ohio. This study suggested a relationship between the increased rates of CNS malformations and the increased risk of exposure to vinyl chloride (VC) in these communities.

Data available through the CDC Birth Defects Monitoring Program (BDMP) (2) provided an opportunity to further examine this suggested relationship. Two hospitals that participate in the BDMP are located in cities with PVC polymerization plants: one in Pennsylvania, the other in Painesville, Ohio. CNS malformation rates for these 2 hospitals in 1970-74 were compared with the rates in their respective

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TABLE I. CASES OF SPECIFIED NOTIFIABLE DISEASES: UNITED STATES
(Cumulative totals include revised and delayed reports through previous weeks)

DISEASE	29th WEEK ENDING		MEDIAN 1970-1974	CUMULATIVE, FIRST 29 WEEKS		
	July 19, 1975	July 20, 1974		1975	1974	MEDIAN 1970-1974
Aseptic meningitis	84	84	172	1,320	1,210	1,334
Brucellosis	5	6	5	118	91	91
Chickenpox	940	928	---	113,682	96,940	---
Diphtheria	5	6	1	203	154	107
Encephalitis						
Primary	17	19	34	386	468	640
Post-Infectious	10	5	11	185	152	177
Type B	240	215	175	6,218	5,814	4,734
Hepatitis, Viral						
Type A	624	823	1,014	19,508	23,859	30,925
Type unspecified	161	106	---	4,494	4,657	---
Malaria	31	11	21	210	101	623
Measles (rubeola)	358	199	271	20,074	18,835	25,764
Meningococcal infections, total	32	20	19	930	845	938
Civilian	31	20	26	909	822	914
Military	1	---	---	21	23	35
Mumps	574	530	698	44,264	42,245	53,831
Pertussis	27	46	---	714	767	---
Rubella (German measles)	79	122	185	14,263	9,015	25,166
Tetanus	4	---	1	44	35	55
Tuberculosis	659	600	---	18,503	16,933	---
Tularemia	4	6	6	63	79	79
Typhoid fever	9	7	7	166	206	173
Typhus, tick-borne (Rky. Mt. spotted fever)	46	34	32	394	418	244
Venereal Diseases:						
Gonorrhea						
Civilian	20,410	18,067	---	527,957	480,767	---
Military	585	625	---	16,362	16,088	---
Syphilis, primary and secondary						
Civilian	387	507	---	14,013	13,907	---
Military	9	10	---	191	255	---
Rabies in animals	60	52	63	1,370	1,637	2,068

TABLE II. NOTIFIABLE DISEASES OF LOW FREQUENCY

	Cum.		Cum.
Anthrax:	---	Poliomyelitis, total:	1
Botulism:	13	Paralytic:	1
Congenital rubella syndrome:	12	Psittacosis: Calif. 1, Texas 1	22
Leprosy: Calif. 2	103	Rabies in man:	1
Leptospirosis: Ga. 1	20	Trichinosis: NYC 1	50
Plague: Utah 1	7	Typhus, murine: Texas 2	17

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VINYL CHLORIDE — Continued

states. No rate increase was seen in the Pennsylvania hospital, but an increase, primarily in the categories of anencephalus and spina bifida, was noted in the Painesville hospital (Table 1).

Table 1
Number of Cases and Rates for Anencephalus and Spina Bifida
in the State of Ohio and the Painesville, Ohio, Hospital,
by Year, 1970-1974

Year	Anencephalus				Spina Bifida			
	Hospital		State		Hospital		State	
	No.	Rate*	No.	Rate	No.	Rate	No.	Rate
1970	(0)	0.0	(26)	5.0	(5)	31.2	(58)	11.1
1971	(1)	10.3	(38)	7.3	(3)	30.9	(14)	8.5
1972	(3)	35.6	(31)	6.3	(0)	0.0	(47)	9.6
1973	(2)	24.0	(27)	5.4	(2)	24.0	(46)	9.2
1974	(0)	0.0	(22)	4.5	(1)	15.1	(29)	6.0
1974	(8)	14.1	(144)	5.7	(9)	21.2	(224)	8.9

*Rates per 10,000 total white births.

The BDMP hospital data for Painesville, Ohio, were compared with the birth certificate data from the Ohio Department of Health and 1 additional case not included in the BDMP report was added to the case group (total of 15). For each case, 2 controls were selected from the hospital birth registry. Medical records for cases and controls were reviewed to confirm the diagnosis and obtain pertinent demographic data, including parental occupation and residence at time of the infant's birth. In addition, parents of 14 of the affected children were interviewed concerning past occupations and residences.

Results of the study indicated that none of the interviewed parents ever worked at either of the 2 PVC polymerization plants in Painesville (1 set of parents could not be located, but records show they did not work at these plants at

the time of their infant's birth); 2 fathers among the parents of the 30 controls were working at 1 of these plants at the time of their infant's births. None of the parents in either group lived within 2 miles of the 2 plants. Statistical analyses comparing the distances from home and workplace to the PVC plants showed no differences between the parents of cases and controls.

(Reported by the Cancer and Birth Defects Division, Bureau of Epidemiology, CDC, in cooperation with the Ohio State Health Department.)

Editorial Note

Vinyl chloride is a known carcinogen (3), and concern has arisen over its possible teratogenic effects. This concern stems from recent studies which have shown a) an increase in mutagenicity in bacterial assay systems (4), and b) increased chromosomal breakage in PVC polymerization workers (5). The Ohio Department of Health study (1) is the only report where VC has been suggested as causing birth defects in humans. Although the follow-up study reported here confirmed a moderate increase in CNS malformations in Painesville, Ohio, it could not establish any association between cases and vinyl chloride exposure. This study clearly does not rule out the possibility that VC may also be teratogenic; other studies are currently underway to evaluate the incidence of birth defects among children of parents highly exposed to PVC.

References

1. Infante P: Oncogenic and mutagenic risk in communities with polyvinyl chloride production facilities. In Program of the Conference on Occupational Carcinogenesis at the New York Academy of Science, 25 March 1975, New York City, March 1975. Proceedings of the New York Academy of Sciences (in press)
2. Center for Disease Control: Congenital Malformations Surveillance, Annual Summary 1974. Atlanta, CDC, July 1975
3. Center for Disease Control: Morbidity and Mortality Weekly Rep 23(6):49-50, 9 February 1974
4. Rannug U, Johansson A, Ramek C, Wachmeister CA: The mutagenicity of vinyl chloride after metabolic activation. *Ambio* 3:194, 1974
5. Funes-Cravioto J, Lambert B, Lindsten J, et al: Chromosome aberrations in workers exposed to vinyl chloride. *Lancet* 1:459, 1975

FOLLOW-UP ON OUTBREAK OF GASTROINTESTINAL ILLNESS AT CRATER LAKE NATIONAL PARK — Oregon

No etiologic agent has yet been demonstrated as the cause of the intestinal illness associated with sewage-contaminated water, that occurred among persons at Crater Lake National Park (MMWR, Vol. 24, No. 28). Rectal swabs and stool specimens from 30 acutely ill persons were negative for salmonellae, shigellae, vibrios, *Yersinia enterocolitica*, and orbivirus. Tests for toxigenic *Escherichia coli* and enteric viruses are in progress.

Three persons with hepatitis who became ill shortly after visiting the park were probably incubating the disease at the time of their visit; 2 of these 3 were reported to have used the park toilet facilities. Surveillance of the exposed population for hepatitis has been initiated by State and Territorial Epidemiologists and by CDC. No definite post-exposure cases

of hepatitis among the persons exposed to the water at Crater Lake during the outbreak have been identified. If any persons develop hepatitis between 2 to 6 weeks after exposure at Crater Lake National Park, they are asked to report their illness to their state health departments and to CDC.

(Reported by members of the Oregon State Health Division and the California State Department of Health; and an EIS Officer.)

Addendum

The following persons who contributed to the investigation of this outbreak were inadvertently omitted from the list of persons mentioned in last week's MMWR: Mary Murphy, RN, Nurse Epidemiologist and Monroe Holmes, DVM, Public Health Veterinarian, Oregon State Health Division.