

CENTER FOR DISEASE CONTROL

Morbidity and Mortality



File → K-1711-110
Vol. 25, No. 8 [1976]
K-3154-
K-60957-

WEEKLY REPORT

For
Week Ending
February 28, 1976

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE PUBLIC HEALTH SERVICE
DATE OF RELEASE: MARCH 5, 1976 - ATLANTA, GEORGIA 30333

EPIDEMIOLOGIC NOTES AND REPORTS ANGIOSARCOMA OF THE LIVER - Wisconsin

In the period June 1973-November 1975, 4 cases of angiosarcoma of the liver (ASL) were diagnosed at the Marshfield Clinic, Marshfield, Wisconsin. One was based on hepatic arteriography and 3 on tissue findings later confirmed by pathologic review at the National Cancer Institute (NCI).

An additional 6 cases, confirmed on pathologic review at NCI and identified through a national ASL case surveillance project initiated at CDC in 1974, have been diagnosed since 1964 in Wisconsin residents. This total of 10 cases is roughly twice as large as might be expected (5.5 cases), based on CDC surveillance estimates of crude ASL incidence for the entire United States. (Five additional cases had been re-

CONTENTS

Epidemiologic Notes and Reports	
Angiosarcoma of the Liver - Wisconsin	57
Possible Lassa Fever - Washington, D.C.	64
Current Trends	
Influenza - Worldwide	63
International Notes	
Salmonella typhimurium - Canary Islands, Finland, and the Federal Republic of Germany	64

ported for Wisconsin; 4 were not confirmed, and 1 was in a resident of another state.)

In view of this relative frequency of cases, together with the recent succession of cases at the Marshfield Clinic, epidemiologic information concerning each of these 10 cases

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

DISEASE	WEEK ENDING		MEDIAN 1971-1975	CUMULATIVE, FIRST 8 WEEKS		
	February 28 1976	February 22 1975		February 28 1976	February 22 1975	MEAN 1971-1975
Aseptic meningitis	28	35	33	307	292	292
Brucellosis	7	2	2	38	21	15
Chickenpox	5,764	4,311	---	39,288	29,653	---
Diphtheria	4	14	6	62	64	23
Encephalitis	13	17	15	129	96	120
Primary	4	7	5	32	33	33
Post-infectious	242	210	172	1,935	1,568	1,314
Hepatitis, Viral	726	707	890	5,409	5,426	7,619
Type A	133	150	---	1,365	1,123	---
Type unspecified	3	6	6	43	42	42
Malaria	805	578	622	4,318	2,668	4,767
Measles (rubeola)	53	41	41	264	270	270
Meningococcal infections, total	53	41	40	281	263	263
Civilian	---	---	1	3	7	9
Military	1,366	1,425	1,892	9,366	11,136	14,246
Mumps	22	24	---	154	201	---
Pertussis	449	285	645	1,870	1,837	3,524
Rubella (German measles)	2	---	---	6	9	8
Tetanus	570	505	---	4,572	4,105	---
Tuberculosis	1	1	1	21	6	15
Tularemia	3	2	4	58	29	37
Typhoid fever	---	---	---	3	10	9
Typhus, tick-borne (Ray, Mt. spotted fever)	---	---	---	---	---	---
Venereal Diseases:						
Gonorrhea	18,313	17,273	---	151,748	141,258	---
Civilian	562	419	---	4,708	4,776	---
Military	528	531	---	4,132	3,938	---
Syphilis, primary and secondary	8	3	---	64	52	---
Civilian	39	45	56	249	284	448
Military	---	---	---	---	---	---

TABLE II. NOTIFIABLE DISEASES OF LOW FREQUENCY

	Cum.		Cum.
Anthrax	2	Poliomyelitis, total	2
Botulism	4	Paralytic: N.Y.C. 1	2
Congenital rubella syndrome	5	Psittacosis: Ohio 1, Calif. 3	19
Leprosy: Pa. 1, Calif. 2	20	Rabies in man:	---
Leptospirosis	7	Trichinosis: N.J. 1	33
Plague	---	Typhus, murre: Tex. 1	2

*Delayed Report for week ending 2/21/76

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ANGIOSARCOMA - Continued

has been assembled through medical record review and family interview (Table 1). Particular attention has been given to potential occupational or environmental exposure to chemicals known to induce ASL (vinyl chloride, arsenic, and thorium dioxide).

Most cases (7 of 10) were diagnosed since 1970, probably reflecting better case ascertainment in recent years. Ages ranged from 36-71 (mean age 58 years). All but 1 patient were male, and all but 1 were white. Places of usual residence for all cases were widely scattered across the state, roughly corresponding with the state's population (Figure 1).

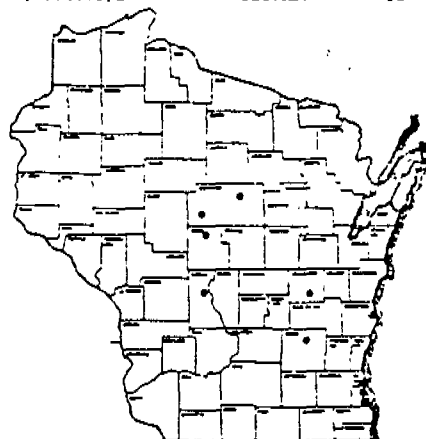
One patient had a history of prior thorium dioxide exposure. For none of the remaining cases was tumor etiology obvious. Occupations and histories of exposure to potential environmental toxins differed widely, with no more than 1 case associated with any particular industry or mode of exposure. In several instances, however, individual patient occupations or exposures were suggestive of possible oncogenicity (Table 1). Patient 10 had had exposure to a vinyl compound; he had worked in paper and plywood products with potential contact with various chemicals, including polyvinyl acetate. Two other patients gave histories of possible exposure to arsenic: patient 9, who had exposure to insecticides while farming, and patient 8, who worked with wood probably treated with arsenic preservatives in the manufacture of bleachers. All but 3 of the 10 patients were known to have lived on farms during their lifetimes, 2 for all of their lives (Table 1).

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Editorial Note

These data indicate no obvious common-source origins among recent cases of ASL in Wisconsin. The marked male preponderance among cases, however, suggests occupational

Figure 1
GEOGRAPHIC DISTRIBUTION OF CONFIRMED CASES OF
ANGIOSARCOMA OF THE LIVER IN WISCONSIN RESIDENTS,
1964-1975, BY PLACE OF USUAL RESIDENCE



exposure as the potential origin for at least some of the cases. Anecdotal histories of occupational and environmental exposures in several of the cases may warrant further investigation, particularly in relation to contact with arsenic. Although at present only vinyl chloride monomer (1), thorium dioxide (2), and arsenic (3,4) are clearly implicated as causes of ASL, investigations such as the one described here may well provide useful leads in defining further causes.

References

1. Creech JL, Johnson MN: Angiosarcoma of liver in the manufacture of polyvinyl chloride. *J Occup Med* 16:150-151, 1974
2. MacMahon HE, Murphy AS, Bates MI: Endothelial-cell sarcoma of liver following Thorotrast injection. *Am J Pathol* 23:585-595, 1947
3. Lender JJ, Stanley RJ, Sumner HW, et al: Angiosarcoma of the liver associated with Fowler's solution (potassium arsenite). *Gastroenterology* 68:1582-1586, 1975
4. Roth F: The sequela of chronic arsenic poisoning in Moselle vintners. *Ger Med Mon* 2:172-175, 1957

Table 1
Cases of ASL in Wisconsin Residents 1964-1975

Case Number	Month and Year Diagnosis	Month and Year Death	Usual Town Of Residence	Age at Diagnosis	Race	Sex	Occupation	Comments	Farm Residence
1	4/64	2/65	Sheboygan	71	W	M	University Teacher	Lived near a chemical company which made plastics and resin	Youth
2	2/67	2/67	Oshkosh	61	W	M	Foundry Welder	Exposure to welding materials and resins	None
3	6/67	6/67	Necedah	36	W	F	Secretary	Infectious hepatitis in childhood, mother and sister had liver disease	Youth
4	7/71	7/71	Milwaukee	68	B	M	Hog Scalded		None
5	4/72	4/72	Milwaukee	64	W	M	Unknown	Exposure to thorium dioxide	Unknown
6	4/74	6/74	Brown Deer	46	W	M	Lutheran Pastor	Lived near a paper mill, 1955-1959	Youth
7	7/74	7/74	Wausau	57	W	M	Rock Crusher; Glue-Liner for rubber raincoats, 1940s	Exposure to silica dust, rubber cement	Youth
8	9/74	9/74	Waupun	46	W	M	Postal Mail Carrier formerly employed by company that made bleachers	Contact with lumber, paints, wood preservatives, (ammoniacal-copper-arsenate wood preservative) (?)	Lifetime
9	8/74	8/74	Stratford	66	W	M	Retired Farmer	No tissue diagnosis; ASL diagnosed by hepatic arteriography	Lifetime
10	11/75	11/75	Marshfield	65	W	M	Press operator for paper and plywood company (23 years)	Contact with wood, plywood, glues, polyvinyl acetate, others	Youth