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S C I T R A N
1482 East Valley Road
Santa Barbara, California 93108
(805) 969-2413

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Preface

Sixteen years have passed since the occurrence of the oil poisoning event in 1968. Oil poisoning is a toxicosis which occurs from the PCB, PCQ, PCDF, etc. included in rice oil, and the symptoms of the disease are very complex. There has been no completed research regarding the cause of death of the patients with oil poisoning, but we and the plaintiff's representatives submitted documents to ask the cooperation of the families of the deceased and we received diagnoses of the dead patients with oil poisoning.

Subjects and Method

The subjects are the 1086 plaintiff oil poisoned patients (581 males and 505 females; among those patients, 42 males and 28 females are dead). The causes of death were determined and classified by following (Statistical Classification Summary of Disease, Injury and Causes of Death, published in 1968 and 1979). The observation period is from January 1, 1969 to October 31, 1983, and knowledge of the population was obtained from the Annual Report of Population Observations. The number of expected deaths was obtained as the basic death rates by sex, age, cause of death and yearly death rate from the vital statistics of the Welfare Ministry.

In this case the death rate of 1981 was applied for that of 1982 and 1983. However, in the case of the analysis of oil

poisoned patients in Fukuoka Prefecture, the Fukuoka Prefecture section in "Revised Death Rates According to the Main Causes of Death in 1980" by the Welfare Ministry was used for the basic death rate between 1977 - 1983. Verification of the difference between observed number and expected number was dependent on a direct probability calculation method based on the Poisson distribution.

Result:

The total observed person-years of the oil poisoned patients were 8282.5 person-years for males and 7282.8 person-years for females. A portion of the results is shown in the table.

As shown in the table, the death of males from malignant neoplasms, especially in the liver, was observed to be significant. And also, if males who are over 40 years old who occupy 93% of the total deaths are observed by separating them into two periods, which are the first period (1969 - 1976) and the latter half period (1977 - 1983), malignant neoplasms, especially in the liver, for males and an accumulation of ischemic heart disease for females is seen in the latter half period. Also, the deaths from malignant neoplasms in the liver of the patients who are males of over 40 years old and the deaths by malignant esophageal neoplasms for females in Fukuoka Prefecture during 1977 - 1983 are significant. Although causes of death in addition to those shown in the table were also observed, remarkable results were not obtained.

Examination

It has been considered from the results of measurements of α-fetoprotein in oil poisoned patients in Fukuoka Prefecture that there was no concern over the occurrence of liver cancer [1]; however, the results of our observations contradicted the theory.

TABLE 1. VERIFICATION OF THE NUMBER OF DEATHS PER CAUSE OF DEATH OF THE OIL POISONED PATIENTS, THE EXPECTED NUMBER OF DEATHS, AND ALSO THE DIFFERENCE BETWEEN THEM

		over 40 years old							
		total		oil poisoned patients 1969-1976		total 1977-1983		Fukuoka prefecture 1977-1983	
Cause of death	Sex	O	E	O	E	O	E	O	E
grand total	*	42	45.81	14	18.49	25	21.69	16	11.22
	**	28	31.03	8	14.08	18	14.28	9	6.05
malignant neoplasms	*	19	11.50	7	4.57	12	6.34	7	3.73
	**	7	7.20	3	3.01	4	3.61	3	2.27
esophagus	*	0	0.55	0	0.24	0	0.31	0	0.18
	**	1	0.12	0	0.06	1	0.06	1(1)	0.03
stomach	*	4	4.23	2	1.94	2	2.14	1	1.14
	**	0	2.23	0	1.02	0	1.02	0	0.61
liver	*	6(2)	1.22	1	0.44	5(2)	0.75	3(1)	0.66
	**	2	0.45	1	0.19	1	0.24	1	0.17
pancreas	*	1	0.54	0	0.20	1	0.32	1	0.17
	**	0	0.30	0	0.11	0	0.18	0	0.13
trachea, bronchus, and lungs	*	3	1.66	2	0.58	1	1.06	1	0.62
	**	0	0.51	0	0.19	0	0.30	0	0.20
breast	*	0	0.00	0	0.00	0	0.00	0	0.00
	**	1	0.49	1	0.19	0	0.26	0	0.16
uterus	*	-	-	-	-	-	-	-	-
	**	1	0.73	0	0.37	1	0.32	1	0.23
leukemia	*	1	0.36	0	0.09	1	0.13	0	0.08
	**	0	0.23	0	0.06	0	0.08	0	0.05
others	*	4	2.93	2	1.07	2	1.63	1	0.89
	**	2	2.15	1	0.82	1	1.16	0	0.69
chronic rheumatic heart disease	*	0	0.17	0	0.09	0	0.06		
	**	0	0.24	0	0.13	0	0.08		
ischemic heart disease	*	3	2.88	0	1.23	2	1.58		
	**	4	1.75	0	0.81	4(1)	0.92		
pulmonary circulation disease	*	5	3.02	2	0.98	3	1.76		
	**	1	2.66	0	1.09	1	1.44		

TABLE 1 (CONTINUED):

Cause of death	Sex	total O	total E	over 40 years old: oil poisoned patients 1969-1976 O	1969-1976 E	total 1977-1983 O	1977-1983 E	Fukuoka prefecture 1977-1983 O	1977-1983 E
other types of heart disease, cardiac insufficiency	*	4	2.31	2	0.71	3	1.40		
	**	1	2.04	0	0.80	1	1.16		
heart disease (a+b+c)	*	8	6.07	2	2.30	5	3.40		
	**	5	4.65	0	2.03	5	2.44		
chronic hepatitis, cirrhosis of liver	*	4	1.74	1	0.73	2	0.90		
	**	1	0.49	0	0.22	1	0.25		

* designates male
** designates female

Remarks: O: observed number of deaths; E: expected number of deaths. Significance (1): 0.01 $p \leq 0.05$; significance at (2): $p \leq 0.01$

Namely, the death rate from liver cancer of male oil poisoned patients was significantly higher, and it was also true for the patients in Fukuoka prefecture. SMR of liver cancer for the total females was 4.44 ($0.05 < p < 0.10$) and is high, but not significantly high. As there is no difference between the Australian antigen positive rate for oil poisoned patients and healthy blood donors [2], it is considered that the contribution of type B hepatitis toward the fact that the death rate of oil poisoned patients with liver cancer is significantly large, can be dismissed. Although the primary factors of job history and drinking history of the patients have to be considered, the fact that liver cancer was observed in a mass of the oil poisoned patients shows that future pursuit and research for this study is important. As one of our studies, Umeda and others have already reported in this conference [3] the fact that there are many patients who have disease of the circulatory organs among the oil poisoned patients, and that this is considered to relate to the death rate of ischemic heart disease.

Conclusion

The causes of the death of oil poisoned patients were studied, and deaths from malignant neoplasms in the liver for males, and from ischemic heart disease for females were analytically realized as significant accumulations. Especially in the case of liver cancer, a definite accumulation was shown after 1977. We would like to consider that the result of the research gave a constant suggestion for future study. Although caution is required for carcinogenic substances (especially idiopathic liver cancer), it is still unknown whether either PCB, PCQ, PCDF plays an important role or whether it is the total action of those three chemicals. Also, since we could not obtain relative factors for job history and drinking history of the oil poisoned patients, we were not able to pursue this study.

Thank you very much to the families of the deceased who supplied us with the diagnoses of the dead oil-poisoned patients.

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[1] Yoshikuni Urabe; Fukuoka Medical Magazine: 65 (1): 1974.

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[3] Gensho Umeda: Nichiei Magazine: 38 (1): 535:1983