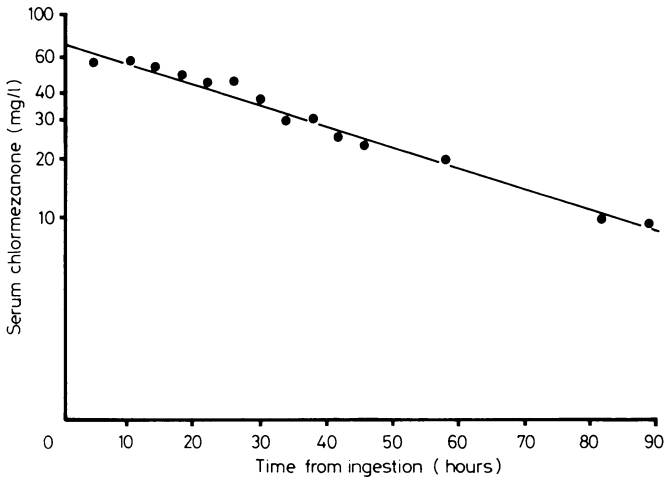


Plasma concentrations of chlormezanone in patient who had taken overdose.

specific high pressure liquid chromatographic method. A drug screen was negative for all other drugs. The terminal half life of chlormezanone was estimated to be 29 hours, and only 217 mg (3% of estimated overdose) was excreted unchanged in urine over 90 hours.

## Comment

Marks[1] has described the case of a 28 year old woman who had ingested 9 g chlormezanone. She became "sleepy" and vomited, but her pulse, blood pressure, and respiration remained normal and she recovered completely within 24 hours.

McChesney *et al*[2] have reported that in man a single 400 mg oral dose of chlormezanone gave peak plasma concentrations, one to two hours after dosing, of 5-6 mg/l and that the mean half life was 24 hours. Only about 1% of the dose was excreted unchanged in the urine during the next 48 hours. The plasma concentrations in our patient were therefore in keeping with the ingestion of a substantial overdose of chlormezanone. The patient nevertheless made an uneventful recovery.

[1] Marks MM. A new tranquilaxant, Trancopal (chlormezanone). *Mo Med* 1961;**58**:1037-9.
[2] McChesney EW, Banks WF Jr, Portmann GA, Crain AVR. Metabolism of chlormezanone in man and laboratory animals. *Biochem Pharmacol* 1967;**16**:813-26.

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# Incidence of liver cancer and trichloroethylene manufacture: joint study by industry and a cancer registry

Trichloroethylene, a high tonnage solvent widely used for degreasing metal and other purposes, has been manufactured at Runcorn since 1909. In 1975 the National Institute of Occupational Safety and Health issued a background information document which characterised trichloroethylene as a potent liver carcinogen in mice. The Employment Medical Advisory Service and Imperial Chemical Industries agreed that a study using data from a cancer registry was the best way to assess the incidence of liver cancer among past employees of the industry. A proposal was drafted with the Mersey Regional Cancer Registry and permission to proceed was granted by the ethical committee of the Mersey Regional Health Authority.

## Methods and results

The Mersey Regional Cancer Registry provided details of all their cases of liver cancer for 1951-77. An alphabetical list was compiled of the 95 subjects with a diagnosis of primary liver cancer and an address near Runcorn. The data for each case were name, address at registration, and dates of birth and registration. Two members of the personnel department at Imperial Chemical Industries compared the tens of thousands of past employees of the Runcorn site during 1934-76 with the registry list. The comparison would produce almost certain matches, probable matches (when only addresses differed), and possible matches.

The comparison produced one probable match and one possible match. The cancer registry sent details to the Department of Health and Social Security at Southport, where they were positively identified as referring to four separate men. It was concluded that none of the subjects had ever worked at the Runcorn site.

## Comment

The observation of liver tumours in mice ingesting high doses of trichloroethylene came from a single study. No cases of liver cancer were found by Axelson *et al*[1] in a cohort study of 500 subjects or by Malek *et al*[2] in a small group of highly exposed dry cleaning operatives in Prague. Novotna *et al*, who studied 63 men with liver cancer in Prague, found that none had a history of occupational exposure to trichloroethylene.[3]

Basing this study on data from a cancer registry was selected from several alternatives. Exposure to trichloroethylene is perhaps highest and least complicated in user industries, but a cohort study of them was considered impracticable because of the many small establishments concerned. A survey of registry records in areas with user industries was not chosen because of the meagre occupational information. A cohort study of the 1000 or so trichloroethylene workers at Runcorn was considered inefficient because it would have meant reviewing over 100 000 personnel department records. Primary liver cancer is so rare that follow up of a population of 10 000 since 1936 would be needed for a satisfactory chance of detecting a doubling of risk. A rough calculation showed that the expected number of cases of primary liver cancer during 1951-77 among Runcorn workers was about 0·3. As a further check the files in the company's computerised medical records system (MORAS) were searched for past employees dying with liver cancer as the underlying cause. One was found, and there was another at a neighbouring works. The cancer registry records showed that the first of these had suffered a primary cancer of the oesophagus with a secondary liver tumour; the other patient had had multiple secondary deposits from an unknown primary tumour.

Determining the incidence of rare forms of cancer in groups of workers by matching cancer registry and employment files could have wide application. Errors are avoidable if one list is alphabetical and short. As two matches are a significant cluster and one suggests a problem no elaborate statistical tests are necessary.

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[1] Axelson O, Andersson K, Hogstedt C, Holmberg B, Molina MD, de Verdier A. A cohort study on trichloroethylene exposure and cancer mortality. *JOM* 1978;**20**:194-6.
[2] Malek B, Kremarova B, Rodova O. An epidemiological study of the hepatic tumour incidence in persons working with trichloroethylene. II—The negative result of investigations among dry-cleaning workers. *Pracovní Lékařství* 1979;**31**:124-6.
[3] Novotna E, David A, Malek B. An epidemiological study of the hepatic tumour incidence in persons working with trichloroethylene. I—The negative result of retrospective investigations in persons with primary liver carcinoma. *Pracovní Lékařství* 1979;**31**:121-3.

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