

and a mononuclear reaction on the surface. The stomach was normal. Paraquat concentrations in kidney and lung were 0.5 µg/g and 1.0 µg/g respectively.

Comment

The striking feature of these cases was the total ulceration of the oesophageal mucosa whereas the stomach was spared. Whether the lack of gastric ulceration was due to the type of epithelium, the presence of acid, mucus, or other local factors is unknown. Ulceration of the mouth and pharynx is almost universal after paraquat ingestion, and pain on swallowing and severe retrosternal discomfort have been reported,<sup>2,3</sup> but oesophageal perforation is uncommon and has not been specifically cited as causing death. Its possible development should be remembered during management. Although paraquat should be removed from the stomach quickly, the immediate use of emetics causing further exposure of the oesophagus to paraquat may be contraindicated. Likewise early control of vomiting produced either by paraquat or Fuller's Earth may be important. Stomach washouts should be done with care because of the danger of oesophageal perforation.<sup>4</sup> In neither of our cases was a definite perforation found, but there is little doubt that a small leak in the oesophagus led to mediastinitis and death.

We thank Dr Rose of ICI Limited, for the paraquat estimations, and Mr Summerfield, the late Manchester coroner, who gave us permission to report these cases.

<sup>1</sup> *Lancet*, 1971, **2**, 1018.  
<sup>2</sup> Bullivant, C M, *British Medical Journal*, 1966, **1**, 1272.  
<sup>3</sup> Gardiner, A J S, *Thorax*, 1972, **27**, 132.  
<sup>4</sup> Malone, J D G, *et al*, *Journal of the Medical Association of Eire*, 1971, **64**, 59.

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Departments of Medicine and Pathology, University Hospital of South Manchester, and the Department of Pathology, University of Manchester  
P ACKRILL, MB, MRCP, consultant physician  
P S HASLETON, MD, MRCPATH, consultant pathologist  
A J RALSTON, MB, FRCP, consultant physician

Severity of notified measles

The introduction in 1968 of routine measles vaccination in the UK was followed by a drop in measles notifications to one-fifth of the previous figures. Recently, however, less than half the children eligible have been vaccinated and annual measles notifications continue to exceed 55 000.<sup>1</sup> To assess current risks from the disease the severity and complications of notified cases were studied by sending an inquiry form to the notifying doctor.

Methods and results

Forms were returned for 8978 cases (82% of the forms sent). The cases were notified in the last quarter of 1976 from 92 area health authorities in England and Wales. They represented one-sixth of the total notifications to

the Office of Population Censuses and Statistics in 1976,<sup>2</sup> with a similar age distribution: 27% of patients were under 3 years, 67% between 3 and 9, and only 0.6% under 6 months. The doctor considered that 4% of cases were severe, 44% moderately severe, and 50% mild. There was little variation with age, although 72% of the few patients under 6 months had mild infections, presumably owing to the persistence of maternal antibody. This was in contrast to the findings in a study on the severity of whooping cough,<sup>3</sup> in which the illness was most severe under the age of 3 months. There were two deaths (both in handicapped children) in the cases studied (0.22/1000), compared with 14 deaths in the 55 361 total notifications (0.25/1000). A total of 934 cases (10%) had one or more complication (table), and 125 (1.4%) were admitted to hospital, with a mean stay of 5.8 days. The 62 neurological complications included two cases of encephalitis confirmed by EEG (aged 2 and 5), one of meningitis (aged 5), and two of meningism; the first three developed a week after an unremarkable attack of measles at home. Of the 42 children with convulsions, one-third had a history in themselves or their siblings; in over half the convulsion was the reason for admission to hospital. Behaviour changes included persistent screaming, excessive irritability, head banging, and excessive drowsiness. The 403 respiratory complications included 113 cases of bronchopneumonia and 12 of bronchiolitis, the remainder being unusually severe bronchitis. Two critical cases of pneumonia occurred in 2-year-old boys, who became increasingly dyspnoeic, cyanosed, and dehydrated a week after the attack of measles. Other complications included: dehydration from vomiting (5), severe epistaxis (3), and conjunctivitis (47). A 25-year-old woman suffered deterioration of her eyesight with partial recovery, and Henoch-Schönlein purpura occurred in a 2-year-old. A 4-year-old developed diabetes and there were two cases of punctate keratitis, one in an 18-year-old, the other in a 1-year-old. Information about measles vaccine was frequently unobtainable but measles occurred in 4% of children vaccinated, two-thirds had a mild attack; there were no neurological complications. The incidence did not increase with the interval since vaccination.

Comment

The last survey of the complications of measles in the UK was in 1963, when 53 000 cases were studied,<sup>4</sup> compared with the 9000 in this survey, in 1976. Nevertheless, the rates for deaths (0.2/1000 cases), admissions to hospital (1%), and respiratory complications (4%) were the same in 1963 and 1976. More neurological complications and otitis media were reported in 1976—0.6% and 5%, respectively—compared with 1963, when the rates were 0.4% and 2.5%. Any study of notified cases is necessarily incomplete, and this one is no exception. Cases which escape notification may include more which are mild and uncomplicated and if this were so the complication rate would be lower. Nevertheless, it is striking that the rates for deaths, hospital admissions, and respiratory and neurological complications have not decreased in 13 years. The only factor which has changed is the total number of cases; the potential dangers from the disease appear to be the same.

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<sup>1</sup> DHSS, *Health and Personal Social Services Statistics for England*. London, HMSO, 1976.  
<sup>2</sup> OPCS Monitor, *Infectious Diseases*. December quarter, 1976.  
<sup>3</sup> Miller, C L, and Fletcher, W B, *British Medical Journal*, 1976, **1**, 117.  
<sup>4</sup> Miller, D L, *British Medical Journal*, 1964, **2**, 75.

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Epidemiological Research Laboratory, Central Public Health Laboratory, London NW9  
CHRISTINE L MILLER, BM, BCH, senior epidemiologist

Numbers (and percentages) of cases with complications, and individual complications according to age. (Cases with more than one complication are included under each heading)

Age group	No of cases	Total No (%) of cases with complications	CNS complications	Behaviour changes	Convulsions	Respiratory	Otitis media	Other
<6 months	54	4 (7)				3 (6)		1 (2)
6-11 months	425	46 (11)	1 (0.2)	1 (0.2)	2 (0.5)	22 (5)	18 (4)	6 (1)
1-2 years	1941	228 (12)	1 (0.1)	8 (0.4)	20 (1)	92 (5)	118 (6)	18 (0.9)
3-4 years	2368	245 (10)		2 (0.1)	13 (0.5)	107 (5)	123 (5)	17 (0.7)
5-9 years	3664	361 (10)	3 (0.1)	3 (0.1)	6 (0.2)	159 (4)	178 (5)	31 (0.8)
10-14 years	350	37 (11)		1 (0.3)	1 (0.3)	16 (5)	19 (5)	1 (0.3)
15+ years	101	9 (9)				3 (3)	2 (2)	4 (4)
Not stated	75	4 (5)				1 (1)	3 (4)	
Total	8978	934 (10)	5 (0.1)	15 (0.2)	42 (0.5)	403 (4)	461 (5)	78 (0.9)