

Hospital Admissions for Adverse Effects of Medicinal Agents (Mainly Self-Poisoning) Among Adolescents in the Oxford Region

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Summary: Hospital statistics for episodes coded as 'adverse effects of medicinal agents' were used to study deliberate self-poisoning among people aged 12–20 years in the Oxford Region. Admission rates rose sharply from the age of 12 years, more so for females than males, up to the age of 16 years in females and 18 years in males. Analgesics, antipyretics and psychotropic drugs were the agents most commonly used by both sexes and accounted for three-quarters of all admissions. Admission rates varied from year to year, but increased overall between 1974 and 1979, notably among people under 16 years of age. Admissions for 'adverse effects of medicinal agents' accounted for 4.7 per cent of all general hospital admissions among people aged 12–20 years.

Since the early 1960's, rates of deliberate self-poisoning have increased substantially (Aitken *et al.*, 1969; Bancroft *et al.*, 1975) and have only shown some sign of levelling off during the past few years. Epidemiological studies of self-poisoning have usually been confined to adults. However, self-poisoning has also increased among teenagers. This requires investigation both to clarify the current position and because an increase in young self-poisoners may have implications for self-poisoning among the same cohort of individuals in later years (Alderson, 1974). We studied data on admissions to hospital for 'adverse effects of medicinal agents' to investigate deliberate self-poisoning among young persons in the Oxford Region between 1974 and 1979.

Method

Data on patients discharged from general hospitals are recorded in Hospital Activity Analysis (HAA). Deliberate self-poisoning has not generally been coded as such in hospital statistics; instead patients discharged after overdoses are usually classified in one of the International Classification of Diseases (ICD) categories covering adverse effects of medicinal agents according to the nature of the main substance used in self-poisoning. Although episodes other than deliberate self-poisoning (e.g., allergic reactions to drugs) are covered by the same codes, hospital admissions for

adverse effects of the therapeutic use of drugs are uncommon in teenagers. In this age group the vast majority of episodes coded in the ICD categories for adverse effects of drugs are in fact cases of deliberate self-poisoning (see below).

All admissions to general hospitals (including admissions to paediatric wards) in the Oxford Region between 1974 and 1979 for people aged 12–20 years, where a discharge diagnosis was recorded in the ICD categories covering adverse effects of medicinal agents, were identified through HAA. The relevant ICD codes for 1974–1978 were ICD 960–979 (ICD, 1969) and for 1979 were ICD 960–977 (ICD, 1977).

In the past few years the Oxford University Department of Psychiatry has maintained a monitoring service in the city of Oxford by means of which all admissions to general medical wards for deliberate self-poisoning are identified. Using this system, and referring to case notes when necessary, a check was carried out of all admissions to these wards recorded in HAA of persons aged 12–20 between 1976 and 1979 with a diagnosis in the relevant ICD codes. Of 682 episodes, there were eight cases of drug addiction or abuse, eight cases of reactions to the therapeutic use of drugs and one set of case notes could not be found. The other 665 (97.5 per cent of the total) were identified as being definite cases of deliberate self-poisoning. Use of hospital statistics based on the ICD categories

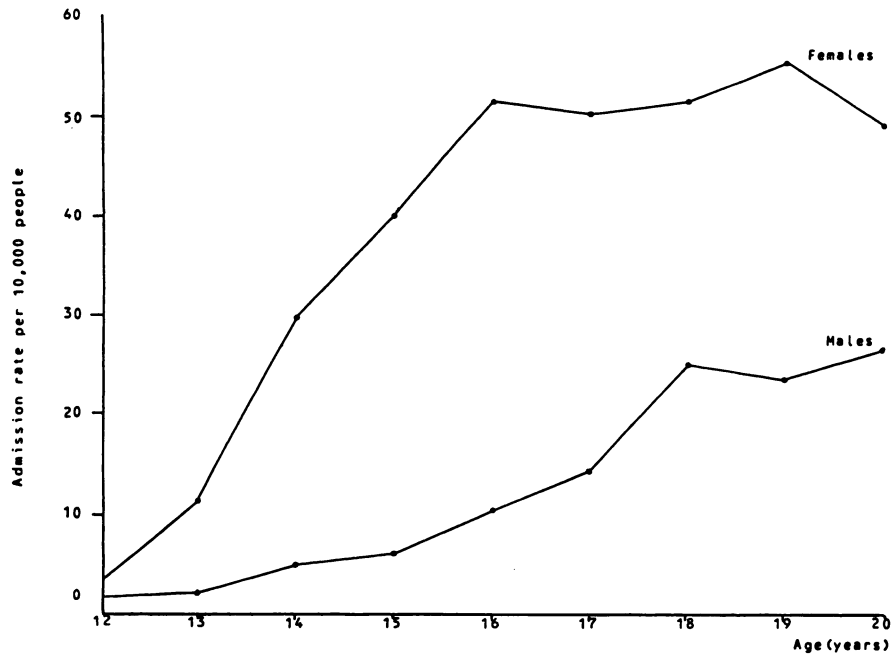


FIG 1.—Average annual admission rate per 10,000 people in each age-sex group.

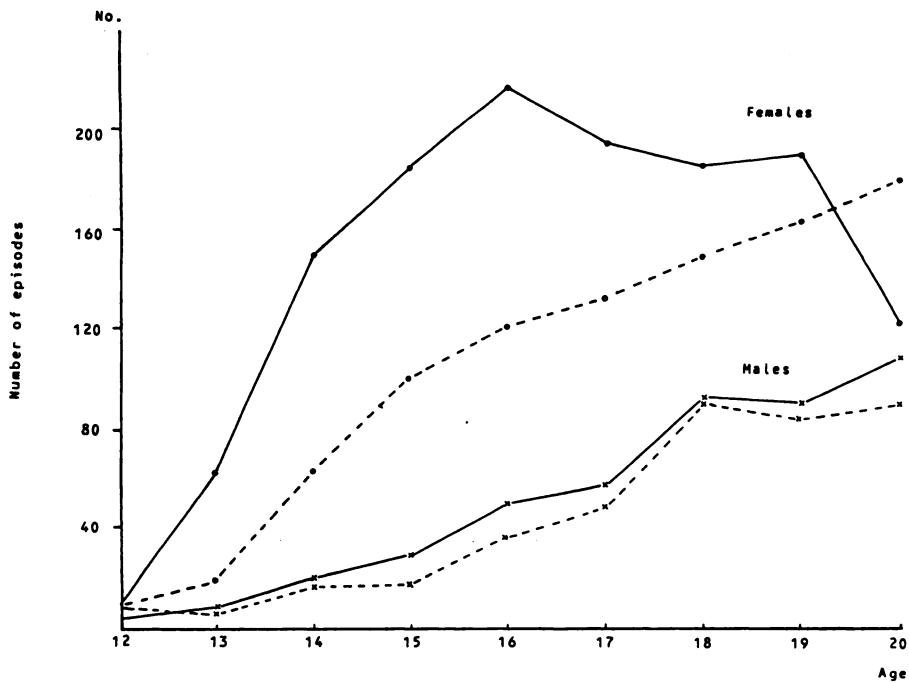


FIG 2.—Number of episodes according to age, sex and medicinal agent.
 — Analgesics and antipyretics; - - - Psychotropic agents.

TABLE I
Number of episodes and rate per 10,000 population by age-group in each year

Year	Age groups					
	12-15 years		16-20 years		12-20 years	
	No.	Rate	No.	Rate	No.	Rate
1974	124	9.7	402	27.7	526	19.3
1975	138	10.5	487	33.2	625	22.4
1976	188	13.8	570	37.7	758	26.4
1977	196	14.1	647	40.7	843	28.3
1978	146	10.6	579	35.2	725	24.0
1979	181	13.1	574	34.1	755	24.7

for adverse effects of medicinal agents therefore seems a reasonable means of carrying out a large scale survey of deliberate self-poisoning among people in this age group.

The data refer to all episodes rather than individual patients—for example, two admissions for the same person are both counted in the statistics.

Results

Age, sex and medicinal agents

Admission rates for both sexes started to increase during the early teenage years with a considerably greater rise among females than males (Fig 1). The ratio of female to male admission rates peaked at about 6:1 at 14 and 15 years of age. Analgesics and antipyretics (ICD 965) accounted for 41.7 per cent, and other drugs which act on the central nervous system (ICD 966-970) accounted for 33.8 per cent, of all episodes. Most drugs in the latter category were psychotropic agents.

The pattern of drugs used at each age by the two sexes is shown in Fig 2. The most striking differences between the sexes were the much greater increase in use of analgesics and antipyretics with age by the younger females compared with younger males; the persistent increase in use of these substances among the older age groups of males compared with a decline in females; and the fact that psychotropic drugs seemed to take over with increasing age as the drugs most frequently used by females but not by males.

The rate of admission for adverse effects of medicinal agents among young people in the region showed an overall increase between 1974 and 1979 (Table I).

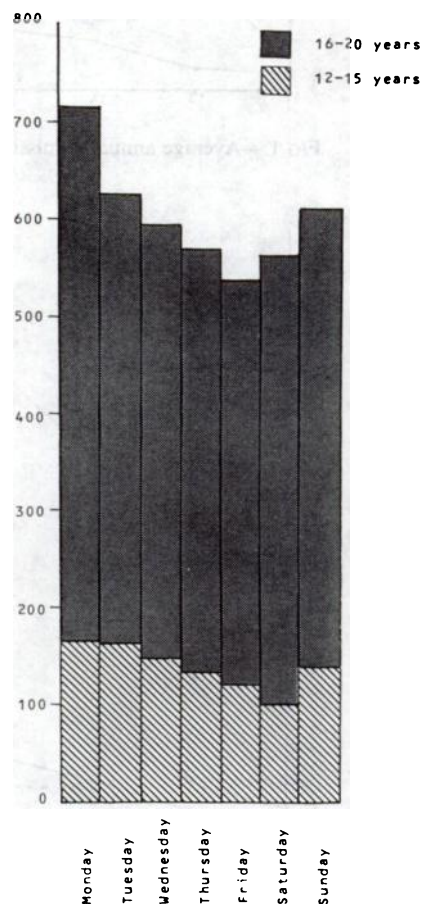


FIG 3.—Number of admissions on each day of the week.

The rise in admission rates was more striking for people aged 12–15 years than for people aged 16–20 years and, during the middle years of the survey period, the increase for females was rather greater than that for males. There was a marked and unexplained decrease in the number of episodes for both age groups and each sex in 1978.

During 1974–9 'adverse effects of medicinal agents' accounted for 4.7 per cent of all hospital admissions among people aged 12–20 years of age.

Seasonal and daily variations

In the 12–15 year age group, 29 per cent of all admissions were in the first quarter of the year compared with 25 per cent, 21 per cent and 25 per cent in the succeeding quarters ($\chi^2(3) = 13.5$, $P < 0.01$). The peak month was March with 102 episodes and the lowest month was August with 65. In the 16–20 year age group admissions were distributed more evenly through the year, with a small but non-significant peak in the spring quarter.

There was a significant difference between the number of episodes on each day of the week ($\chi^2(3) = 33.6$, $P < 0.001$). Overall there were more admissions on Mondays than on any other day of the week (Fig 3). In people aged 12–15 years there were fewer admissions on Saturdays, and in people aged 16–20 years there were fewer admissions on Fridays, than on the other days of the week.

Discussion

Knowledge concerning the problem of deliberate self-poisoning among adolescents is most likely to develop from studies of two kinds. The first, as reported here, consists of studying statistics relating to a large population in order to monitor the general distribution of the problem. The second, which has also recently been carried out in Oxford (Hawton *et al*, 1982(b)), consists of examination of smaller numbers of cases in detail in order to determine the characteristics of the individuals involved in self-poisoning, their problems, their response to treatment and so on. The comparison of HAA data with the cases recorded in the monitoring service for Oxford City indicates that routine hospital statistics can be used for large scale studies of deliberate self-poisoning in this age group.

The very large increase in the rates with which patients were admitted to general hospitals for deliberate self-poisoning during the 1960's and early 1970's (Aitken *et al*, 1969; Bancroft *et al*, 1975) appears recently to have shown some levelling off among adults (Gibbons *et al*, 1978; Hawton *et al*,

1982(a)). Our study demonstrates that hospital admission rates among adolescents continued to rise overall, at least in the Oxford Region, during the mid-1970's, although the highest rates were reached in 1977 and there was a small decline in 1978. The increase among people aged 12–15 years is a particular cause for concern because individuals in this age group are likely to use analgesics in self-poisoning and in many cases the analgesic is paracetamol (Hawton *et al*, 1982(a)).

Seasonal variation was slight. The small spring peak found in our study is in keeping with the findings for suicide in adults (Adelstein and Mardon, 1975), although little or no seasonal difference is usually found for non-fatal deliberate self-poisoning. The modest excess of admissions on Mondays may be related to problems with school or work becoming more pressing at the beginning of the week, although there may be other explanations.

There is now a case for exploring the possibilities for prevention. Reducing the availability of analgesics to prescriptions only has had no appeal. Warning notices on bottle labels do not appear to have had any discernible effect. Controversy exists as to whether prescribing of psychotherapeutic agents actually facilitates overdose taking in some cases, but there would seem to be good reason for recommending very cautious use of such drugs for teenagers, and perhaps in particular for teenage girls.

The scale of self-poisoning in adolescents is now so considerable that the role of measures such as counselling services and prevention through education needs to be discussed, developed and evaluated.

References

- ADELSTEIN, A. & MARDON, C. (1975) Suicides 1961–74. In *Population Trends*, No. 2, London: HMSO.
- AITKEN, R. C. B., BUGLASS, D. & KREITMAN, N. (1969) The changing pattern of attempted suicide in Edinburgh, 1962–67. *British Journal of Preventive and Social Medicine*, **23**, 111–15.
- ALDERSON, M. R. (1974) Self-poisoning—what is the future? *Lancet*, *i*, 1040–3.
- BANCROFT, J. H. J., SKRIMSHIRE, A. M., REYNOLDS, F., SIMKIN, S. & SMITH, J. (1975) Self-poisoning and self-injury in the Oxford Area: Epidemiological aspects 1969–73. *British Journal of Preventive and Social Medicine*, **29**, 170–7.
- GIBBONS, J. S., ELLIOTT, J., URWIN, P. & GIBBONS, J. L. (1978) The urban environment and deliberate self-poisoning trends in Southampton 1972–77. *Social Psychiatry*, **13**, 159–66.
- HAWTON, K., FAGG, J., MARSACK, P. & WELLS, P. (1982a) Deliberate self-poisoning and self-injury in the Oxford Area: 1972–80. *Social Psychiatry*, (in press).

- O'GRADY, J., OSBORN, M. & COLE, D. (1982b) Adolescents who take overdoses: Their characteristics, problems and contacts with helping agencies. *British Journal of Psychiatry*, **140**, 118–23.
- WORLD HEALTH ORGANISATION (1969) *International Classification of Diseases: Eighth Revision*. WHO: Geneva.
- (1977) *International Classification of Diseases: Ninth Revision*. WHO: Geneva.

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