Paracetamol-related deaths in Scotland, 1994–2000

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Aims To investigate the death rate due to paracetamol poisoning in Scotland and what effect the reduction in over-the-counter paracetamol pack sizes in 1998 had on the death rate.

Methods Records from 1994 to 2000 were examined to identify the number and annual incidence of paracetamol-related deaths. Numbers of deaths before and after the pack size reduction were compared.

Results No significant differences were shown due to the pack size reduction. The Scottish paracetamol-related death rate was twice as high as in England and Wales.

Conclusions Further measures to reduce paracetamol-related morbidity and mortality in Scotland should be considered.

Keywords: acetaminophen, death, epidemiology, paracetamol, Scotland, self-poisoning, toxicity

Introduction

Paracetamol (acetaminophen), a common analgesic, has been available over the counter (without a prescription) since the late 1950s [1]. Since the mid-1970s the number of paracetamol overdoses has increased. Paracetamol is now the drug most frequently used in deliberate self-poisoning in the United Kingdom [2]. Between 1993 and 1997, in England and Wales, there were on average 500 paracetamol related deaths per year [3].

In September 1998 following guidance from the Medicines Control Agency the amount of paracetamol that could be purchased over the counter was restricted to 16 tablets (8 g) in general stores and 32 tablets (16 g) from pharmacies [4]. Data from England, Wales and Northern Ireland have shown that the number of overdoses has reduced, however, this is not the case in Scotland [5–9]. There are no data in the United Kingdom on death rates due to paracetamol since the pack size reduction in 1998.

In this paper we have studied deaths attributable to paracetamol in Scotland and we have examined data from

before and after 1998 to assess the effect of the pack size reduction.

Methods

In Scotland, data are published annually in a report from the General Register Office for Scotland (GROS). A key table within this report lists all the drugs involved in fatal poisoning throughout Scotland. The GROS annual reports were hand searched from 1994 to 2000 to identify any death related to paracetamol. These were divided into deaths where paracetamol was the only drug recorded and all deaths associated with paracetamol. The latter included compound drugs containing paracetamol (e.g. coproxamol, cocodamol), and mixed overdoses of paracetamol with other drugs. These were then totalled. From the same records the numbers of deaths from all poisonings for each year were noted. This included deaths related to drugs, gases and vapours.

Annual population figures for Scotland were also obtained from GROS and annual incidence was calculated.

Statistics

It was important to compare equal lengths of time before and after the pack size reduction. This occurred in September 1998 and so this year was censored from the analysis. The chi-squared test was used to identify any

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significant differences between the number of deaths involving paracetamol and all deaths due to poisoning for 1996 and 1997 compared with 1999 and 2000.

Results

The data are shown in Table 1.

Between 1994 and 2000 inclusive there were 3878 deaths due to poisoning in Scotland, 644 of which involved paracetamol. Thus 16.6% of deaths due to poisoning in Scotland involved paracetamol.

The total number of deaths from all poisonings has increased. Until 1999, there was a decline in the deaths from paracetamol alone, even before the pack size reduction in 1998. This trend was most marked in males. In all groups there was a fall in deaths due to paracetamol in 1999 but this increased again in 2000. There were no significant differences between deaths involving paracetamol and all poisonings before and after 1998.

The mean annual rate for all paracetamol-related deaths in Scotland from 1994 to 2000 was 17.9 per million (18.5 per million for males and 17.4 per million for females). If deaths recorded as solely involving paracetamol are examined the mean annual death rate from 1994 to 2000 is 5.4 per million. The yearly death rate mirrors the number of deaths because the population has been stable throughout the study period.

Discussion

This paper shows that in Scotland there is considerable mortality related to paracetamol use with 16.6% of all deaths from poisoning involving this agent. The over the counter paracetamol pack size reduction has had no significant effect on the number of deaths. These data raise concerns as to whether paracetamol continues to have a

favourable risk/benefit profile and whether it should remain available as an over the counter drug in Scotland.

In England and Wales (for the years 1993–97) the mean rates for all paracetamol related deaths are 10 per million for males and 9.1 per million for females. There were 3.4 per million deaths due to paracetamol alone [3]. The rates in Scotland are almost two fold higher. The reasons for the higher mortality in Scotland are unclear from the data presented but this obviously has important implications for the burden of paracetamol related toxicity to the National Health Service in Scotland.

The limitations of this study are that GROS reports diagnoses verbatim and so there may be some problems of classification, e.g. a death involving coproxamol may be reported to GROS as involving paracetamol and dextropropoxyphene. Equally there is no certainty as to which specific drug actually caused the death. Looking at deaths involving a single drug (i.e. paracetamol) overcomes this problem, and in this study the annual death rate where paracetamol is the only drug reported is still considerably higher in Scotland than in England and Wales.

In conclusion, this is the first study examining what effects the pack size change in 1998 has had on the number of deaths from paracetamol poisoning. It has shown that there has been no lasting effect, at least, in Scotland. Similar studies will be needed in the rest of the United Kingdom before these findings can be generalized to the entire country. The death rate in Scotland is considerably higher than the rest of the United Kingdom. Alternative ways of reducing paracetamol related deaths must be considered.

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Table 1 Data on population, all drug poisoning and paracetamol poisoning from the Annual Reports of the Registrar General for Scotland 1994–2000.

Year	Scottish population			All deaths due to poisoning			All paracetamol related deaths			Deaths related to paracetamol alone		
	T	M	F	T	M	F	T	M	F	T	M	F
1994	5132400	2486237	2646163	559	382	177	90	40	50	38	15	23
1995	5136600	2489155	2647445	528	363	165	81	40	41	27	13	14
1996	5128000	2485811	2642189	555	394	161	96	53	43	27	14	13
1997	5122500	2484307	2638193	548	377	171	102	39	63	31	9	22
1998	5120000	2484401	2635599	538	386	152	93	51	42	20	8	12
<i>OTC paracetamol pack size reduction – September 1998</i>												
1999	5119200	2485648	2633552	576	415	161	70	35	35	20	7	13
2000	5114600	2484687	2629913	574	427	147	112	65	47	31	16	15
<i>P value for 96/97 vs 99/00*</i>							0.18	0.97	0.14	0.36	0.76	0.54

T = Total, M = Male, F = Female. * Chi-Squared test comparing all deaths from poisonings and paracetamol related deaths.

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