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Deaths from chickenpox in England and Wales 1995-7: analysis of routine mortality data
Helen Rawson, Amelia Crampin, Norman Noah

Abstract
Objective To evaluate the epidemiology and impact of mortality from chickenpox in England and Wales.
Design Review of death certificates from the Office for National Statistics on which codes for "chickenpox" or "varicella" were mentioned. Further information ascertained from certifying physician.
Participants Those certified as having died from chickenpox in England and Wales, 1995-7.
Main outcome measures Diagnosis and age and sex distributions of deaths from chickenpox.
Results On average, 25 people a year die from chickenpox. Overall case fatality was 9.22 per 100 000 consultations for chickenpox. Adults accounted for 81% of deaths and 19% of consultations. Deaths were twice as common in men as in women. More of those who died were born outside United Kingdom than expected (12% v 4%).
Conclusions Chickenpox is not a mild disease. Deaths in adults are increasing, both in number and proportion.

Introduction
The age distribution of people with chickenpox and mortality from the disease in developed countries are changing. In England and Wales deaths in adults have increased in number. In the United States chickenpox is the leading cause of deaths that could be prevented by vaccine. As part of a larger study on the burden of chickenpox we reviewed deaths from chickenpox in England and Wales for 1995-7.

Methods
We obtained copies of death certificates that mentioned "chickenpox" or "varicella" (ICD-9 (international classification of diseases, 9th revision) code 052; ICD-10 (10th revision) code B01) for 1995-7 and data on the annual numbers of deaths for 1985-97 from the Office for National Statistics. We sent questionnaires to the physicians responsible for the patients to clarify the diagnosis. Using this information we classified deaths into those in which primary infection with varicella zoster virus was the definite or probable underlying cause of death and those in which it could be excluded. We also reviewed confidential inquiries into maternal deaths in the United Kingdom for 1985-96. The research unit of the Royal College of General Practitioners provided data on age and sex specific incidences of chickenpox.

Results
Response rates and varicella classification
We obtained 119 death certificates. Of these, we classified 71 (60%) deaths as definitely or probably due to chickenpox (for example, chickenpox pneumonia, generalised chickenpox, etc). Of these, 58 replies from physicians confirmed 56 (97%) as definite, so we estimated 97% (12.6) of the 13 remaining cases for which we had no confirmation as definite (table 1). Of the 48 (40%) that we classified as uncertain or not due to chickenpox, 19 of 36 physicians (53%) confirmed the diagnosis on the certificate. We therefore estimated 53% (6.3) of the 12 remaining as chickenpox. Thus, of the original 119 deaths, we estimated that 94 (79%) were really attributable to chickenpox (table 1). This is a lower bound value. We had no further information for 25 cases (no reply from physician in charge in 14 cases and notes lost in 11 cases). The overall response rate therefore was 88% (105/119).

In these 94 cases, physicians gave chickenpox as a definite or contributory cause of death in 75 (80%) (table 1). In the 19 remaining cases (20%) the disease present was herpes zoster (shingles). Of these 75, nine (12%, 95% confidence interval 5% to 19%), all adults, were born outside Europe or North America. Twenty eight patients (37%) had a known exposure to chickenpox or herpes zoster within the three weeks before onset; 13 (17%) had no known exposure; and 33 (44%) were unaware of any exposure. One patient gave no details. From 1985 to 1996 deaths of seven women...
Table 2:

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Deaths (confirmed)</th>
</tr>
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<tbody>
<tr>
<td>0-4</td>
<td>12</td>
</tr>
<tr>
<td>5-14</td>
<td>2</td>
</tr>
<tr>
<td>15-44</td>
<td>29</td>
</tr>
<tr>
<td>45-64</td>
<td>11</td>
</tr>
<tr>
<td>⩾65</td>
<td>21</td>
</tr>
<tr>
<td>Total</td>
<td>75</td>
</tr>
</tbody>
</table>

Table 3:

<table>
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<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
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<td>5-14</td>
<td>1.3</td>
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<td>2.7</td>
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<td>15-44</td>
<td>28.6</td>
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<td>36.7</td>
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<tr>
<td>45-64</td>
<td>8.9</td>
<td>5.3</td>
<td>14.2</td>
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<td>⩾65</td>
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</tr>
<tr>
<td>Total</td>
<td>66.7</td>
<td>33.3</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 2: Estimated case fatality by age group per 100 000, 1995-7

Table 3: Confirmed deaths from chickenpox by age group and sex, 1995-7. Figures are number (percentage) of deaths.

Discussion

Mortality from chickenpox is not negligible. During 1995-7, 81 deaths were recorded by the Office for National Statistics. However, we received 119 certificates that mentioned chickenpox or varicella. After detailed inquiries, we estimated that at least 75 were genuine cases of chickenpox. This suggests at least 25 deaths from chickenpox annually. In 1996-7 there were seven certified deaths from whooping cough, mumps, measles, and Haemophilus influenzae type b (Hib) meningitis in England and Wales compared with 67 from chickenpox.

Specificity of diagnosis

We asked the clinician concerned to review our presumptive diagnosis taken from the certificate. There was a good response and excellent consistency between our assessment and theirs, especially in those we classified as true chickenpox (consistency 97%). This suggests high specificity. Sensitivity may have been lower because, conversely, some deaths from chickenpox may not be correctly coded or certified, and we may have lost some. Thus our figure of 25 deaths a year from chickenpox is probably an underestimate.

Role of vaccine

A chickenpox vaccine is available, though not yet licensed in the United Kingdom. Our results do not on their own provide sufficient evidence for mass vaccination. We need information not only on the burden of disease at primary and secondary care levels, but also on the effect of the vaccine on herpes zoster. We also need to ensure a high enough uptake so that the disease does not shift towards the older population and a higher mortality.

The good correlation between the number of deaths annually and the general practitioners’ base rate of clinical chickenpox supports our view that death certification from chickenpox does indeed reflect the
We thank the many physicians who responded to our survey, the staff of the Office for National Statistics, London, and the Royal College of General Practitioners Research Unit, Birmingham, for the supply of data, and Dr Richard Hooper for statistical advice.

Contributors: HR obtained, collated, and analysed the data and contributed to early drafts of the paper. AC contributed to the design and analysis, liaised with the certifying physicians, classified the deaths, and wrote the first draft of the paper. NN conceived and initiated the study, contributed to the interpretation of the data, and wrote the final drafts. NN will act as guarantor.

Funding: Pasteur Merieux MSD for studies of chickenpox morbidity and mortality.

Competing interests: NN received a grant and funding for a research assistant from Pasteur-Merieux (manufacturers of a chickenpox vaccine) and has been reimbursed in part for attending a conference.

7 Garnett GP, Cox MJ, Bundy DAP, Didier JM, St.Catharine J. The age of chickenpox vaccine) and has been reimbursed in part for attending a conference.

Reducing violence in severe mental illness: randomised controlled trial of intensive case management compared with standard care

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Abstract

Objectives To establish whether intensive case management reduces violence in patients with psychosis in comparison with standard case management.

Design Randomised controlled trial with two year follow up.

Setting Four inner city community mental health services.

Participants 708 patients with established psychotic illness allocated at random to intervention (353) or control (355) group.

Intervention Intensive case management (caseload 10-15 per case manager) for two years compared with standard case management (30-35 per case manager).

Main outcome measure Physical assault over two years measured by interviews with patients and case managers and examination of case notes.

Results No significant reduction in violence was found in the intensive case management group compared with the control group (22.7% vs 21.9%, P = 0.86).

Conclusions Intensive case management does not reduce the prevalence of violence in psychotic patients in comparison with standard care.

Introduction

Serious acts of violence committed by people with mental illness are statistically rare events. Efforts of community services to prevent violence by the small subgroup at risk may be limited by the lack of effectiveness of standard treatment interventions, inadequate attention to clinical factors associated with violence—for example, drug misuse and poor engagement and treatment adherence by patients—and the difficulty of altering risk associated with impoverished and dangerous living environments. Fragmentation between services compounds the difficulties.

The care programme approach was introduced, partly to address this fragmentation, after several killings by people with severe mental illness were much reported in the media. The key elements are assessment of need and risk, development of a care plan, nomination of a responsible key worker, and regular review. Case management incorporates these