PRACTICE OBSERVED

Practice Research

Measles: Who pays the cost?

ADRIAN HASTINGS, ANNE HOSTLER, ANN SOLEN

Abstract

An epidemic of measles resulting in 164 cases in a Leicester group practice was analysed by means of a case-control study and a questionnaire. Estimates were made of the physical, social, and financial costs to children, parents, and family doctors. On average each child was ill for 10.8 days and the illness cost his parents £11.06. His family doctor spent 26 minutes providing care.

These results provide an additional stimulus to the primary care team to promote the uptake of measles vaccination.

Introduction

The serious complications of measles are well documented, but little has been written about the effects of the less severe infections seen in general practice. This study was designed to establish whether the impact of a measles epidemic on us and our patients justified the effort needed to lift vaccination rates to an acceptable level.

Our practice cares for nearly 10 000 patients, including 1400 children under the age of 10. Most are working class living in council houses. Unemployment is high, though the area is without some of the worst features of urban decay. Measles vaccination is below national and local averages. Of all children born in 1982, only 47% had been vaccinated by December 1984. Comparable figures for England and Leicestershire are 63.4% and 68.1%.¹

Subjects and methods

In the first part of the study the records of all 164 children notified as cases of measles during an epidemic between 30 September 1985 and 2 March 1986 were examined. The diagnosis was made clinically by any of the five partners. All events (consultations, home visits, problems and diagnoses, hospital admissions, and prescriptions issued) which occurred in the six days before diagnosis and 28 days after were recorded. To determine the normal "background" level of illness a control of the same sex and closest in age to each case was selected from the age-sex register. The differences in diagnoses and prescriptions issued to cases as compared with controls were taken as an index of the true morbidity produced by measles. In order to refute the alternative explanation that the cases were inherently more prone to illness or their parents were less "able" we studied the previous consultation pattern in a random sample of 40 matched cases and controls. The rest of the study concerned the attitude of parents and the impact of the illness on the family. A sample of 60 of the 164 cases was chosen by using a random number series. A questionnaire was successfully administered in 55. This asked about the length and severity of the illness, the effect on the child's sleeping pattern, the expenses incurred by the family, and how the parents' attitude to vaccination was altered by their experience.

Results

In the three months before the epidemic the sample of 40 cases consulted a similar number of times to the controls (cases 22, controls 25).

Cost to children—Children who developed measles suffered from substantially more additional episodes of illness. Table I sets out the principal diagnoses in the cases and controls. Each patient, on average, saw a doctor 1.94 times and required 1.21 prescriptions. Controls were seen 0.42 times and required 0.36 prescriptions. The proportions attributable to measles were 1.5 doctor-patient contacts and 0.85 prescriptions (table II). Four children were admitted to hospital, where they spent a total of 14 days. The discharge diagnoses were measles (two cases), febrile convulsion and measles, and pneumonia and measles. None of the four had been vaccinated. For the 55 children whose parents were interviewed the length of illness ranged from one to 35 days. For 17 (31%) it lasted less than one week, for 18 (33%) one to two weeks, for 10 (18%) two to three weeks, for 5 (9%) three to four weeks, and for 3 (5%) over four weeks. Two did not respond. The average length of illness for all cases was 10.8 days.

Leicester LE2 6UL

ADRIAN HASTINGS, MB, CHB, general practitioner

ANNE HOSTLER, SRN, HV, health visitor

ANN SOLEN, SRN, HV, health visitor

Correspondence to: Dr A Hastings, 509 Saffron Lane, Leicester LE2 6UL.

TABLE I—Illnesses during study period

Problems/diagnoses	Cases	Controls
Measles	164	0
Ear infection requiring systemic antibiotic	15	1
Eye infection requiring topical antibiotic	11	3
Respiratory tract infection requiring antibiotic	57	8
Respiratory tract infection not requiring antibiotic	9	18
Diarrhoea or vomiting, or both	13	5
Asthma	8	2
Rash/infection	3	9
Chickenpox	0	3
Others	10	9
Total	290	58

TABLE II—Main differences between cases and controls

	Cases (n=164)	Controls (n=164)	Proportion attributable to epidemic
No (%) vaccinated against measles	26 (15.9)	73 (44.5)	
No of consultations	114	49	65
No per patient	0.70	0.30	0.40
No of home visits	204	20	184
No per patient	1.24	0.12	1.10
No of prescriptions	199	59	140
No per patient	1.21	0.36	0.85

Cost to doctors—If we assume that each consultation lasts 7.5 minutes and a home visit 20 minutes we can calculate the additional workload due to the epidemic. The total medical time was 69.5 hours with an average per case of 26 minutes. We compared the severity of illness suffered by the 26 cases who had been vaccinated with that of the 138 who had not. The average number of home visits for each non-vaccinated case was 1.3 compared with 0.96 for vaccinated cases. The average number of prescriptions was similarly higher at 1.29 against 0.73. Marginally fewer non-vaccinated cases were seen at the surgery (0.69 against 0.73).

Cost to parents—In eight of the 55 families interviewed a parent had had to take time off work. Wages lost ranged from nil to £150, with an average of £50.50. Forty three children (78%) required over the counter medicines, costing on average £1.51. The parents of 24 children (44%) spent an average of £5.83 on additional comforts such as special food and drinks and additional heating. The overall average cost was £11.06. We also asked about the degree of worry experienced by the parents. Sixteen (29%) were very worried, 17 (31%) worried, 13 (24%) slightly worried, and 8 (15%) not worried. One did not respond. Thirty six (65%) of the children in the sample caused their carer to have broken sleep during the illness (range one to 12 nights). Nine (16%) children had disturbed sleep patterns persisting for longer than two weeks after their illness. Fifty (91%) of the parents could recall correctly their child's measles vaccination state. We asked whether their experience had altered their attitude to vaccination. Of the 15 parents who believed that their child had been vaccinated, only one thought the vaccine to be a waste of time. Several commented spontaneously that their child's illness had been milder because of vaccination. Nineteen of the 40 parents who believed that their children had not been vaccinated remained unconvinced of the value of vaccination despite their child having the disease.

Discussion

Our findings support the view that measles vaccination is cost effective for children, their parents, and family doctors. Measles can be a very severe illness, causing death in 0.2/1000 cases and neurological complications in 0.6% of notified cases.² We find that children with ordinary measles who escape these complications

nevertheless suffer a prolonged and unpleasant illness. Caution must be exercised in extrapolating from our results, as they depend in part on the social characteristics of our patients and the diagnostic and prescribing habits of the doctors in our practice. As the diagnosis was a clinical one it is probable that among the 164 cases there were some children who actually suffered an illness other than measles. This may help to explain why 16% of cases had been vaccinated, which is a higher proportion than would be expected given the efficacy of the vaccine. It is possible virtually to eliminate measles: America and Czechoslovakia have almost reached this goal.³ In the absence of a radical break with existing government policy—for example, by making school entry contingent on proof of measles immune state—high uptake in Britain will depend on the voluntary efforts of health visitors and general practitioners. Impressive results have been achieved in difficult conditions.⁴

We attribute our low rate of measles vaccination to several factors. The parents of over a fifth of children in our practice have withheld consent because of fears about its safety. We encounter a fatalistic attitude, which is illustrated by our finding that parents remain sceptical of the value of vaccination even after experiencing the disease. In the past the vaccination nurse sent away any child with the mildest symptoms and greatly amplified the recognised contraindications to vaccination. Over 60% of vaccination appointments generated for us by the health authority computer are not kept. Many of our patients find it difficult to keep an appointment, particularly when they are not given the opportunity to arrange it for a time convenient to themselves. In one sense the computer is a victim of its own efficiency. It generates two further appointments if a patient defaults. As a result parents assume that their child will be sent for again if they do not come. When no further appointments arrive they tend to believe that their child is fully vaccinated.

We have adopted three policies to counteract these factors. (a) We use the findings of our study in discussion with parents who withhold consent. (b) The vaccination nurse calls the doctor in to see any child she is unhappy about vaccinating. In most cases the doctor can authorise vaccination to be performed there and then. (c) Every time a child fails to attend this is noted on his continuation card and highlighted with green ink. This provides a bold reminder to any doctor to raise the question of vaccination when the child is next seen. The doctors in our practice do not believe that we will achieve our target rate of over 90% by these measures alone and think that we shall need to adopt a policy of unscheduled and opportunistic vaccination in the future. Though this practice would contravene the policy of the Leicestershire Health Authority, we maintain that the benefits will outweigh the theoretical risks of duplicate vaccination, which can be minimised by careful record keeping. In the same amount of time that we spent caring for children during this epidemic we could have seen 417 women in our well woman clinic or taken the blood pressure of 1390 adults on an opportunistic basis. In a busy practice self interest should ensure that we will continue to promote measles vaccination.

We thank Sharon Barnett and Irene Iliffe for their invaluable help with the secretarial work and Dr Angus Nichol for advice.

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(Accepted 24 April 1987)