

## Mothers' appreciation of their children's symptoms

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**SUMMARY.** A prospective study of mothers' reactions to their babies' symptoms was carried out in Newcastle upon Tyne. Forty-four mothers kept a health diary about their first infant, recording symptoms that occurred and action taken. Symptoms, most of which were minor, were present on three out of four days. Mothers were therefore making almost daily decisions about their babies' health, usually without medical advice. No evidence was found of mothers failing to appreciate the severity of symptoms or failing to seek medical help. Our findings reinforce those of other studies that parents are able to recognize their babies' illnesses, even in their first children.

### Introduction

**S**TUDIES of unexpected infant deaths show that in some cases no explanation for the death is discovered, even at post-mortem; in others an adequate cause for death is found. Sometimes symptoms are present before death but do not explain why the child died. Two studies of unexpected infant deaths have compared the days before death with the days before interview for age-matched control children. These have shown a greater number of symptoms, which were more serious and of longer duration, in the children who died (Stanton *et al.*, 1978; Carpenter *et al.*, 1979). The presence of illness before some unexpected deaths has led to the suggestion that some parents are failing to appreciate the severity of symptoms or failing to seek appropriate medical help (Richards and McIntosh, 1972; Cameron and Watson, 1975; McWeeny and Emery, 1975; Stanton *et al.*, 1978).

However, conclusions about symptom appreciation made from any study of unexpected deaths or of acute illness admitted to hospital are limited. The limitation is

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that events may be viewed very differently in the light of the eventual serious outcome. It cannot be known if anyone else would have reacted differently in the situation, and it may not be justifiable to blame parents. Prospective studies of parents' reactions to the normal symptoms of infancy are necessary if we are to find out whether parents are failing to appreciate the severity of their babies' symptoms and to seek medical help. One such study is reported here.

### Methods

#### *The sample*

Four Newcastle inner-city wards were chosen for study. They form an area of high economic deprivation, and have been shown to have unusually large numbers of unexpected deaths (Working Party for Early Childhood Deaths, 1977). General practitioners with surgeries in these areas agreed to help with the study. After approval by the Area Health Authority Ethical Committee, the names of all first children born between 1 July and 31 December 1979 whose mothers were registered with these 19 practices were obtained from the AHA computerized list of children to be notified for immunization; 125 children were identified. Eight children with Pakistani or Indian names were excluded because important cultural differences in parents' reactions to symptoms were expected in these families. Their exclusion also avoided language difficulties. The remaining 117 children were then stratified by general practice and age of child and allocated at random to study and control groups.

The study group of 58 mothers were approached by an introductory letter and then visited. Three were excluded because they had moved out of the area and two because the baby was not living with the mother. Forty-four (83 per cent) of the remaining 53 mothers agreed to help with the study.

#### *Health diaries*

The mothers in the study group were asked to keep daily diaries of their babies' health for eight weeks. The diary

Case number <input type="text"/>		Mon	Tues	Wed	Thur	Fri	Sat	Sun
Week number <input type="text"/>		1	2	3	4	5	6	7
If your baby had any of these, please tick the box for that day.	Had a feeding problem							
	Brought up small amounts of feed							
	Brought up large amounts of feed							
	Was 'windy' with obvious discomfort							
	Had loose, frequent motions							
	Was constipated							
	Cried more often than usual							
	Different type of cry from usual							
	Fretful, 'niggly' and not sleeping							
	Slept more than usual							
	Had a cold without a cough							
	Had a cold with a cough							
	Was breathing fast or having difficulty getting breath							
	Was hot, seemed to have a temperature							
	Had runny ears							
	Had a nappy rash							
	Had a rash (spots) – not nappy rash							
	Had discomfort with teething							
	Had an accident							
Other								
If you talked to anyone about what was troubling the baby, please tick the box for that person on that day.	Baby's father							
	One of baby's grandparents							
	A friend or other relative							
	Book or magazine							
	Health visitor							
	Clinic doctor							
	Spoke to GP on telephone							
	Saw GP							
	Chemist							
	Casualty department							
	Other							

Figure 1. First sheet of the health diary.

was simple to complete; it covered one week and consisted of two sheets of paper. On the first was a list of common symptoms of infancy and a list of people whom they might consult (Figure 1). Mothers were asked to tick each day on which any symptom had been present and to put a tick against any of the people they had consulted. The second sheet gave space for the mothers to write comments about the baby's health. Mothers were visited after the first, second, fourth, sixth and eighth weeks. Information on the baby, family, pregnancy and mother's health was collected at one of the visits. All visits were made by the same

interviewer (C.J.P.) and took place between February and May 1980.

*Consultations*

The control group was used to assess the impact of the diary-keeping and visits on the consultation behaviour of the mothers in the study group. The number of contacts with the general practitioner and health visitor (as noted in their records) and the number of child health clinic attendances were collected for both groups for the months February to May 1980. The two groups

**Table 1.** Variables used in logistic discriminant analysis.

Variable number	Description
1	Total number of major symptoms in episode of illness.
2	Maximum number of major symptoms on any one day of the episode.
3	Length of episode (days).
4	Baby's age (weeks).
5	Mother's age (years).
6	Baby's sex (male/female).
7	Mother's report of problems with the pregnancy and birth (none/few/many/very many).
8	Baby's most serious previous illness seen by (no doctor/GP or clinic doctor/hospital).
9	Mother's health since baby was born (good/poor/very poor).
10	Father's help with tasks of caring for baby (none/some/many/all).
11	Mother saw one of baby's grandparents (daily/twice a week or more/weekly/less than weekly).
12	Mother helped to look after a baby before (yes/no).
13	Mother known seriously ill or dead baby before (yes/no).
14	Mother stayed at school after age 16 (yes/no).
15	Number of times mother pregnant before.
16	Time usually taken to reach GP surgery (minutes).
17	How easy to get to see GP (easy/moderate/difficult).
18	Mother's satisfaction with GP (satisfied/indifferent/dissatisfied).

were then compared. We included health visitor contacts because, although the majority are not mother-initiated, the frequency of contact is likely to be increased if the mother asks for help.

### *Episodes of illness*

In order to identify any mothers who were under- or over-reacting to the seriousness of their baby's illness, episodes of illness or significant upsets were separated from everyday or occasional symptoms. The method by which an episode of illness was defined is outlined below. Consultation with a doctor during one of these episodes was then used as a crude indicator of mothers' reactions to their babies' ill health. Episodes with and without a medical consultation were compared using a statistical technique which, on the basis of variables describing the illness and personal and social characteristics of the mother and baby, determined the probability of a consultation having taken place for each of the episodes. Those episodes with a high probability of consultation but in which no doctor was seen may indicate mothers who were failing to appreciate the severity of symptoms and seek medical help. Those episodes with a low probability of consultation but during which one did occur may point to mothers who were overconsulting or overworried about the baby.

The definition of an episode of illness was based on the number and severity of symptoms recorded in the diaries. The first stage of this was the calculation of a symptom score for each day. We designated symptoms as major or minor. Major symptoms ("brought up large amounts of feed", "had loose, frequent motions", "had a cold with a cough", "was breathing fast or having difficulty getting breath" and "was hot, seemed to have a temperature") were given a score of four points. All other symptoms (see Figure 1) scored one point, except "had a cold without cough" which scored two. The number of points scored on one day was added to give the symptom score for that day.

The existence of an episode of illness was defined as a symptom score of six or more on one day, or a major symptom present on three consecutive days. Adjacent days were then included in the episode if they had a symptom score of three or more. Finally, one further day was included at each end of the episode if it had a symptom score of two. Variables included in the analysis of episodes of illness are shown in Table 1.

### *Statistical methods*

The statistical technique of stepwise logistic discriminant analysis selects the variables which give the best prediction of whether or not a consultation took place. Each variable is chosen to give the greatest improvement in prediction over that already made, and this process continues until no statistically significant improvement in prediction is gained. Variables which emerge as significant are predictors of consultation, and should not be seen as the explanation of it. (See Pattison (1980) and Russel and Gregson (1981) for a full description of this technique.)

### **Results**

#### *Mothers and babies in the study group*

Thirty of the 44 mothers kept the diary for the whole eight weeks, and only four for less than three weeks. The ages of the babies about whom diaries were kept ranged from 6 to 45 weeks. Mothers were aged between 17 and 31 years (Table 2) and came predominantly from social classes IIIM and IV. Unmarried mothers were probably under-represented; four of the nine who declined to keep diaries, but only 10 of the 44 mothers who took part, were known to be unmarried.

#### *Validity of the diaries*

For 38 infants it was possible to compare the number of times "saw GP" was ticked in the diaries with the number of consultations noted in the general practitioners' records on the baby. Twenty-nine consultations were noted in the records, but "saw GP" was ticked 39 times by the mothers. This suggests that mothers were more reliable than general practitioners in recording consultations.

**Table 2.** Age of mothers.

Age in years on 1/1/80	Number of mothers	Percentage of mothers
17-19	7	16
20-22	21	48
23-25	9	20
26-31	6	14
Unknown	1	2
Total	44	100

**Table 3.** Number of symptoms recorded on each diary day.

Number of symptoms on one day	Number of days	Percentage of days
0	535	25.4
1	696	33.1
2	482	22.9
3	227	10.8
4	93	4.4
5	41	1.9
6	19	0.9
7	8	0.4
8	4	0.2
Total	2,105	100.0

### Impact of diaries on consultation behaviour

The comparison of control and study groups showed no significant differences between the two groups in the numbers of contacts with the health visitor or in child health clinic attendances. However, when the number of consultations noted in the general practitioners' records for each group were compared, the study group was found to have consulted significantly less than the control group. The mean number of consultations over the four months February to May 1980 was 1.9 for cases and 2.6 for controls; using a Mann-Whitney U test this difference is significant at the 5 per cent level ( $z = -2.12$ ). Since the groups were matched for general practitioner, variations in recording of consultations should have affected both groups in the same way.

### Symptoms

Diaries were kept for a total of 2,105 days, 85 per cent of the 2,464 days possible if all mothers taking part had completed the full eight weeks. Symptoms were recorded on 75 per cent of these days. One symptom only was recorded on 33 per cent of all days, but four or more symptoms were ticked on 8 per cent (Table 3). If "had a feeding problem" and "brought up small amounts of feed" are excluded, symptoms were still present on 64 per cent of days. The symptom ticked most often was "brought up small amounts of feed". Other very common symptoms were "fretful and niggly", "cried more often than usual" and "had discomfort with teething" (Table 4). Professional advice was given on only 6 per

**Table 4.** Symptoms recorded in diaries (total number of diary days = 2,105).

Symptom	Number of days	Percentage of days
Had a feeding problem	130	6
Brought up small amounts of feed	489	23
Brought up large amounts of feed	91	4
Was 'windy' with obvious discomfort	72	3
Had loose, frequent motions	128	6
Was constipated	58	3
Cried more often than usual	225	11
Different type of cry from usual	76	4
Fretful, 'niggly' and not sleeping	220	10
Slept more than usual	167	8
Had a cold without a cough	140	7
Had a cold with a cough	168	8
Was breathing fast or having difficulty getting breath	17	1
Was hot, seemed to have a temperature	37	2
Had runny ears	54	3
Had a nappy rash	189	9
Had a rash (spots)—not nappy rash	112	5
Has discomfort with teething	680	32
Other	54	3

cent of days on which symptoms were present. The baby's father and grandparents were much more common sources of advice for the mother (Table 5).

### Episodes of illness

A total of 74 episodes occurred and a doctor (either general practitioner or child health clinic doctor) was consulted during 33 of them (45 per cent). Thirty-five children had at least one episode of illness.

Two variables emerged as significant predictors of consultation. These were, in order of predictive importance:

1. Total number of major symptoms in episode. A consultation was most likely to have taken place in episodes with the largest number of major symptoms.
2. Previous experience with babies. Mothers who said that they had helped to look after a baby before having their own (other than just babysitting) were more likely to consult a doctor if their own baby was ill. This relationship points in the same direction when considered alone (Table 6).

Figure 2 shows the probability of consulting for each of the episodes of illness in this study. At a high probability of consulting, most babies were taken to the doctor, and vice versa. Episodes of illness where the consultation behaviour was very different from that predicted are easily identified and are described here in more detail.

There were only two episodes of illness for which our

statistical analysis strongly predicted a consultation but for which the mother did not consult. Both of these mothers were unmarried and neither was living with the baby's father. They both kept the diary for only four of the eight weeks.

The first mother, aged 24, lived on her own with the baby but very near to her own mother. She had not helped to look after a baby before having her daughter 'T', who was 27 weeks old when this episode of illness occurred. The main symptom was

a cold with a cough which lasted for two weeks. On three days T also brought up large amounts of feed but otherwise had only 'minor' symptoms: she was fretful and niggly, cried, and brought up small amounts of feed. The mother did not record having consulted anyone during the two weeks. She had consulted a doctor, as predicted, during a previous episode of illness.

The second mother was 21 years old, and lived with a man who was not the baby's father. During the illness, which lasted eight days, she recorded having consulted a friend or relative on six of the days and a chemist on three. For the first five days 31-week-old 'M' had a cold with a cough and was breathing quickly or having difficulty getting her breath. She was fretful, niggly and cried more than usual during this time. On the fourth day she also seemed to have a temperature. For the final three days her mother recorded that M had a feeding problem and slept more than usual. This was the third episode of illness during the four weeks for which this mother kept the diary. She acted as predicted in both of the others, consulting during one and not during the other. She had helped to look after a baby before having M.

**Table 5.** Sources of advice about symptoms (total number of days on which symptoms were present = 1,570).

Source of advice*	Number of days	Percentage of days on which symptoms were present
Baby's father	306	19
One of baby's grandparents	136	9
A friend or other relative	70	4
Health visitor	20	1
Clinic doctor	23	1
Saw GP	43	3

\*Advice may have been received from more than one source on any one day.

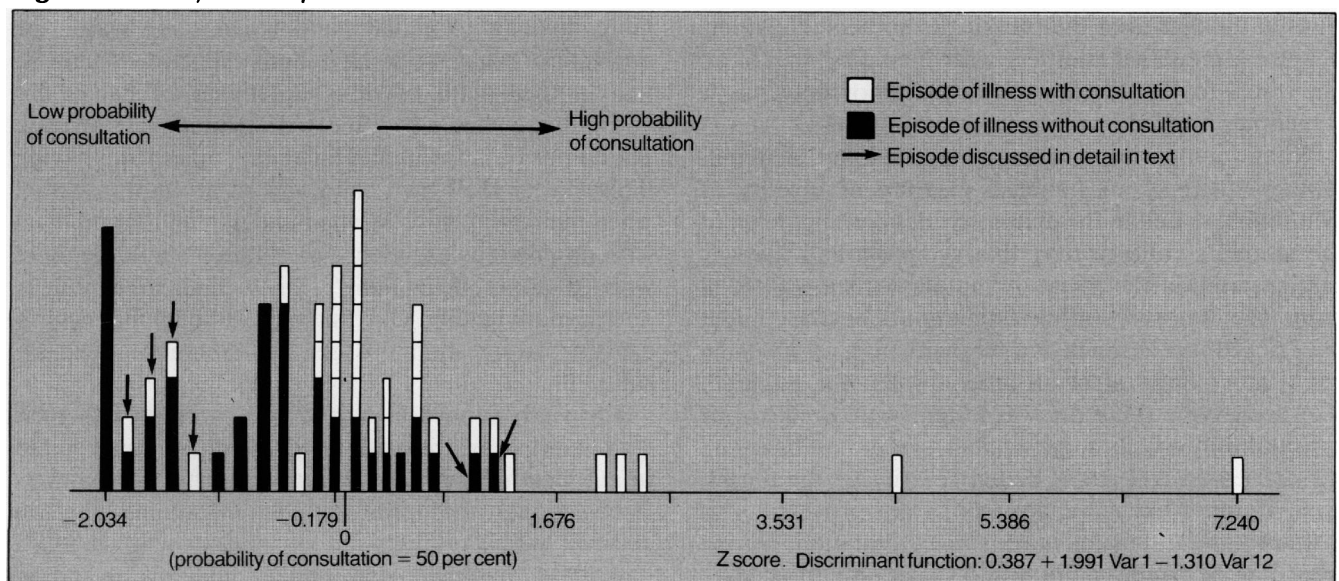
**Table 6.** Mothers' previous experience with babies.

	Consultation during episode of illness		Total
	Yes	No	
Previous experience	25	22	47
No previous experience	8	19	27
Total	33	41	74

Significance test:  $\chi^2 = 3.852$  (significant at 5 per cent level).

Four mothers had taken their baby to the doctor when our analysis predicted that they would not. None of these mothers had helped to look after a baby before having their own. The episode of illness with the lowest probability of consultation occurred in a 16-week-old girl, 'S'. Three days before the start of the illness the health visitor had called and said that S had eczema which should be taken to the doctor if it did not improve. The baby was then unwell, had a temperature and was off her food. The mother consulted the doctor on the third day of this illness. It seems here that the combination of the baby being unwell and the eczema, about which she had been advised to see the doctor, prompted this consultation. The second case was a 21-week-old boy who had a cold (without a cough) and was hot for two days. On the first day the mother gave a dose of 'Calpol', and on the second took him to the doctor. This mother had not been well since the baby was born, and had not enjoyed breast-feeding him though she was continuing with this. She was particular-

**Figure 2.** Analysis of episodes of illness.



ly worried at the time of this illness because her own mother was about to go into hospital.

The following two cases had slightly higher probabilities of a consultation occurring. One of these mothers was 19 years old and unmarried. Her 31-week-old boy had had loose motions for four days when she took him to see the general practitioner. He had no other symptoms during this time. The other case was 36-week-old baby 'C'. This episode of illness lasted four days and the general practitioner was consulted on the second. For the first three days C had loose motions, and on the first and second days she also brought up large amounts of feed. It could be interpreted from the symptoms that were ticked in the diaries that both of these babies were quite ill. However, comparatively few symptoms were recorded during these two episodes, which may explain why our analysis suggests that these mothers acted unpredictably in consulting their doctor.

### **Discussion**

Mothers were encouraged to tick the diary if they were worried about the symptom, or if it was particularly unusual for their baby. The symptoms that were ticked are not therefore incidence rates of any medically defined condition, but they do give an indication of the frequency with which mothers had some concern about that symptom. On 75 per cent of days mothers were making decisions about their baby's health, but a doctor or health visitor was consulted on only 6 per cent of the days when symptoms were present. Lloyd and colleagues (1981) reported that 9 per cent of babies with symptoms were taken to see the doctor, but they do not define symptoms or say if visits to a doctor at a child health clinic were included. A more comparable study is that of Spencer (1980), where a very similar diary was used, although with a predominantly middle-class group of mothers for a much shorter period of time. He found that professional help was sought on 17 per cent of days when symptoms were present. This difference may be partly explained by the large number of minor symptoms in the diaries of the Newcastle mothers. However, it does suggest that mothers with their first babies do not resort to the doctor with every minor upset, as is sometimes implied.

When comparing diaries completed by different mothers there is no standard measure of severity of symptoms. A tick in the diary provides evidence both of the mother's concern over that symptom and the way that she viewed the diary. A mother with a slightly ill baby who was very enthusiastic about the diary might have ticked just as much as a mother with a very ill baby but a more ambivalent attitude towards the research. However, symptom score was a significant predictor of consultation, which suggests that symptoms ticked in the diaries do reflect the actual severity of the illness. Even if more extensive definitions are provided, this difficulty will remain until some validation of the recording of symptoms in health diaries is carried out.

The mothers who took part in the study consulted the doctor about their baby less than the control group of mothers. Speculative reasons for this have interesting implications for the provision of primary health care for mothers with young children. Four possible explanations are considered here:

1. The mothers had a listener interested in anything they wanted to say about the baby, someone they knew would be coming back to see them again. The interviewer attempted to remain verbally and non-verbally neutral in her reactions to the mothers' anxieties about their babies. The lack of a worried reaction may have been reassuring to mothers. They were also aware that the interviewer was seeing a number of babies during the study and so may have ascribed a certain expertise to her for that reason.
2. The presence of a sympathetic listener to the mother's as well as the baby's problems may have prevented some consultations where the baby provided an occasion for the mother to talk to someone about her own worries.
3. The symptoms in the diary are common in infancy. The fact that a particular condition was listed may have reassured some mothers that their baby's illness was not as unusual as their own experience suggested.
4. Filling in the diary was in itself some action taken in response to the baby's illness and may therefore have decreased the need for further action in some situations.

All of these reasons suggest that an available listener, who would not need to be highly medically trained, might be an alternative to professional advice for mothers in some situations, without endangering the baby.

Two variables in the analysis of episodes of illness were significant predictors of consultation. It is not surprising that the total symptom score had an important relationship to consultation. The finding that mothers who said they had helped to look after a baby before having their own were more likely to consult is more difficult to explain and is, in some ways, the opposite of what might have been expected. It may be that mothers with previous experience of babies are aware that a child's health can deteriorate very rapidly, but do not have the confidence that comes from having looked after their own child and so are more worried when their baby is ill. We had anticipated that mothers with no previous experience of children would be more worried about their baby's illness and so consult a doctor more readily. Our findings, although not easy to explain, do question this perhaps commonly held assumption.

The study looked at a group of mothers with their first babies in an area with a high number of unexpected infant deaths, but found little evidence of mothers failing to seek appropriate help for symptoms. The two episodes where mothers did not consult when it might have been expected that they would be worrying.

# The

M&B May & Baker

# Diagnostic Quiz

The answers to the January quiz are as follows:

1. What is the likely cause of this appearance?

**$\beta$ -blocker induced digital ischaemia**

2. What alternative diagnosis should be considered?

**Embolism (from heart or proximal vessels)**

**Vasculitis (possibly hydralazine related)**

**Diabetes (possibly thiazide related)**

3. What is the initial management?

**Withdrawal of  $\beta$ -blocker**

The winner of a £100 British Airways travel voucher is Penelope Aeberhard of Stoke Poges, Bucks.

## INNER CITIES

### Occasional Paper 19

The problems of general medical practice in inner cities are becoming increasingly well known and some important reports have recently been published, particularly about general practice in London.

*Occasional Paper 19* by Dr K. J. Bolden, Senior Lecturer at the Department of General Practice, University of Exeter, is based on the report for which the author won the 1980 Upjohn Prize, and analyses problems of general practice in several inner cities in different parts of the country.

Whereas many are critical of doctors working in these areas, Dr Bolden illustrates vividly some of the difficulties which practitioners encounter and makes a number of suggestions as to how they can be overcome.

*Inner Cities, Occasional Paper 19*, is available now, price £3.00 including postage, from the Royal College of General Practitioners, 14 Princes Gate, Hyde Park, London SW7 1PU. Payment should be made with order.

However, in general, the findings of this study support those of Spencer (1980) that parents can recognize illness, even in their first children. Unexpected infant deaths are more common in higher birth-order than in first-born children. If some parents of babies who die are failing to appreciate the severity of symptoms and seek medical help, it is necessary to explain why the skills of illness recognition demonstrated in this study for the first-born are not being used with subsequent children.

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## Alcohol consumption

Consumer expenditure on alcohol in 1980 was £10,170 million.

Source: Federation of Alcoholic Rehabilitation Establishments. *Newsletter*, December 1981/January 1982.