Field trials of the Baby Check score card in general practice

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Abstract

Sixteen general practitioners (GPs) used the Baby Check score card to assess illness severity in 86 babies under 6 months old. Their reactions to Baby Check were positive: in 79 (92%) it gave an accurate assessment of the baby's illness and 16 (100%) said they would trust it. Fifteen (94%) found it useful, and most of those who did not said the baby was not ill or had an obvious diagnosis. Thirteen (81%) said they would use it and wanted their health visitors and midwives to use it and 15 (94%) wanted the mothers in their practice to use it. The majority (64%) of babies scored 0-7; 31% scored 8 to 19; and only 5% scored over 20. Well babies had low scores, while the two sickest babies, needing urgent hospital treatment, scored 29 and 33. The use of Baby Check by GPs would help them assess babies thoroughly and quantify illness severity objectively.

The assessment of illness in babies in the first few months of life can be difficult for general practitioners (GPs) because many lack paediatric training¹ and most of the babies they see are mildly ill. Many of the symptoms seen in seriously ill babies are also common in babies who are well or mildly ill.² Early recognition of serious illness in babies might reduce both morbidity and mortality.³

The Baby Check scoring system, presented in companion papers,^{4,5} has been developed to help parents, nurses, and doctors quantify the severity of acute systemic illness in babies in the first six months of life. The severity of a baby's illness is assessed using seven symptoms and 12 signs and adding the scores for any which are positive. The higher the total score the sicker the baby.

The health professionals' version of Baby Check contains the 19 checks with definitions, instructions on use, and information about low scoring conditions that still require attention—for example, convulsions or an abscess. It also contains a table showing the chance of a baby with each score being well or mildly ill, moderately ill, or seriously ill.

For parents the scores were divided into four groups: 0 to 7, 8 to 12, 13 to 19, and 20 or more. Table 1 shows the advice given to parents for each score group.

This paper reports a field trial in which GPs used Baby Check when assessing babies presenting with an acute illness.

Table 1 Summary of advice given to parents for each score group

Score	Advice
0 to 7	Your baby is well or only a little unwell and is not likely to need medical attention at the moment
8 to 12	Your baby is unwell, but is unlikely to be seriously ill at the moment. Contact your doctor, health visitor, or midwife for advice. If you think your baby is getting worse do the score again
13 to 19	Your baby is ill and needs to be seen by a doctor. Contact your doctor now and arrange for your baby to be seen
20 or more	Your baby may be seriously ill and needs to be seen by a doctor straight away

Methods

One hundred and twenty seven local GPs were invited to participate in the trial: of these 28 agreed. Four others also asked to take part. Each participant was sent a booklet containing 10 score cards and forms for data collection. They were asked to assess babies under 6 months of age who presented with an acute illness. Firstly they had to record their impression of the severity of the baby's illness in four categories: well, mildly ill, moderately ill, and seriously ill. They then scored the baby using Baby Check, after which they graded their final impression of the baby's illness on a seven point scale, which was simplified into four grades for analysis.

After each assessment the GPs answered questions about the usefulness and accuracy of the score. At the end of the study a questionnaire asked for their impressions of the system. They were given no additional instructions about its use so that the field trial could assess Baby Check as it might be used in general practice.

Results

Of the 32 GPs in the field trial 17 completed 94 assessments. Eight of these had to be excluded because the doctor misunderstood the score card.

QUESTIONS ASKED AFTER EACH ASSESSMENT

Was Baby Check helpful?

An answer was recorded for 78 cases. In 58 (74%) Baby Check was found helpful. In 20 (26%) it was not particularly helpful because the baby was clearly not ill or had an obvious diagnosis: thus a Baby Check assessment and score was not required. In one case the GP was worried that a temperature of 38.1°C was not reflected in the score.

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Did you miss out any checks?

Rectal temperature was omitted in 12 (14%) assessments, seven because the assessor did not have a thermometer. In five they thought it was unnecessary. In four (5%) they forgot the big toe squeeze.

Were any of the checks difficult or unclear?

Checks were reported as being difficult in six (7%) cases. Concentration was difficult in two because the baby was either crying or had his eyes closed. Awareness, drowsiness, cyanosis, unusual cry, and temperature were each mentioned once.

QUESTIONS ASKED AT THE END OF THE TRIAL

Is Baby Check useful for assessing illness in babies?

Fifteen GPs (94%) said it was useful. The other one felt his own judgment and the family history were more important.

Would you trust Baby Check as an indicator of illness severity?

All said yes.

Would you like to use Baby Check if it became available?

Thirteen (81%) said yes. Two (13%) said they might use it occasionally. One (6%) said he would rely on his own judgment.

How would you use Baby Check?

Of the 13 (81%) who said they would use it, five (38%) would use it for all consultations about acute illness and eight (62%) only when they thought the baby was at risk of serious illness.

Would you like your health visitors and midwives to use Baby Check?

Thirteen (81%) said yes.

Would you like the parents in your practice to use Baby Check?

Fifteen (94%) said they would like their parents to use it.

Profile of scores (n=86). The number of babies within each score are shown at the top of each column.

Table 2 Scores thought to be too high or too low

Score thought to be too high:

- (1) Scored 9. Diagnosed as having thrush. Given a prescription
- (2) Scored 18. The examination revealed a hernia, but the general practitioner felt this was not causing any problems
- (3) Scored 29. Admitted to paediatric intensive care, diagnosed congenital adrenal hyperplasia

Score thought to be too low:

- (1) Scored 7. A 'happy wheezer'. General practitioner thought the score did not represent the level of risk because the mother was exhausted and the social circumstances were poor
- (2) Scored 6. Jaundiced baby, 11 days old, weighed less than birth weight. Referred to hospital but not admitted
- (3) Scored 11. Referred to hospital but not admitted. Diagnosis of otitis media
- (4) Scored 2. Mother reported the baby had difficulty breathing. No treatment given

GP'S OPINION OF THE ACCURACY OF THE SCORE CARD

The GPs were asked whether they thought the score gave an accurate assessment of the baby's illness. In 79 of the 86 assessments (92%) they said that it did, in three (3%) they thought the score was too high for the severity of illness and in four (5%) they thought the score was too low for the severity of illness. These cases are shown in table 2.

SCORES RELATED TO THE SEVERITY OF ILLNESS

The percentage of the babies with each score is shown in the figure. The distribution of babies in the four score groups was: 55 (64%) scored 0 to 7, 17 (20%) scored 8 to 12, 10 (12%) scored 13 to 19, and four (5%) scored 20 or more. The GPs' initial impression of the severity of the babies' illness before they did the Baby Check score, and their final grading are shown in tables 3 and 4 correlated with the score groups. The scores of babies with different diagnoses are shown in table 5.

Babies scoring 0 to 7

Of the 55 babies in this group, the initial impression was that 51 (93%) were well or mildly ill. The diagnoses made were: upper respiratory tract infection (n=25), well (n=9), viral infection (n=4), mild gastroenteritis (n=3), conjunctivitis (n=2), rash (n=2), otitis media (n=2), thrush (n=1), umbilical sepsis (n=1), 'happy wheezer' (n=1), and feeding problem (n=1). Three (5%) were considered to be moderately ill, their diagnoses were: a feeding problem, an upper respiratory tract infection, and breast milk jaundice. None was considered to be seriously ill. One was not graded.

Table 3 Initial impression of illness severity correlated with the score groups

Illness severity	Score groups			
	0 to 7	8 to 12	13 to 19	20 or more
Well	20	0	1	0
Mildly ill	31	14	4	2
Moderately ill	3	2	5	2
Seriously ill	0	0	0	0

The initial impression was not recorded for two babies.

Table 4 Final grading of the illness severity correlated with the score groups

Grade of illness severity	Score groups			
	0 to 7	8 to 12	13 to 19	20 or more
(1) Has a serious illness needing hospital treatment	0	0	1	2
(2) Requires hospital admission for observation due to uncertainty about the severity of the illness	1	1	0	0
(3) Needs careful observation and treatment. Could be managed at home by a capable mother	5	4	6	1
(4) Mildly ill or well. Could be managed at home by any mother	49	12	3	1

Table 5 Diagnoses and scores

Diagnosis	No of babies	Median (range) score
Upper respiratory tract infection	31	3 (0 to 12)
Well and minor problems	14	0 (0 to 4)
Viral infection	14	10 (0 to 21)
Bronchiolitis/bronchitis	6	13 (4 to 33)
Gastroenteritis	6	6 (3 to 19)
<i>Individual scores</i>		
Otitis media	4	4, 6, 11, 12
Conjunctivitis	4	0, 0, 8, 20
Thrush	3	0, 4, 9
Adrenal hyperplasia	1	29
Inguinal hernia	1	18
Umbilical infection	1	7
Jaundice	1	6

At the final grading 49 (89%) were considered to be well or only mildly ill (grade 4). One (2%) was referred to hospital (grade 2) because his parents were worried as a sibling had died from a respiratory infection, and five (9%) were considered to need careful observation (grade 3).

Babies scoring 8 to 12

Of the 17 babies in this group the initial impression was that 14 (82%) were mildly ill. The diagnoses made were: upper respiratory tract infection (n=8), viral infection (n=2), gastroenteritis (n=1), thrush (n=1), conjunctivitis with jaundice (n=1), bronchiolitis (n=1). Two (12%) were moderately ill. Their diagnoses were upper respiratory tract infection and otitis media. One was not graded.

At the final grading, 12 (71%) were graded 4 and four others (24%) were graded 3; one (6%) with otitis media was considered to need hospital observation (grade 2) and was seen but not admitted.

Babies scoring 13 to 19

Of the 10 babies in this group, the initial impression was that one (10%) was well, having presented with crying all night. He was found to have an inguinal hernia when examined. Four (40%) were mildly ill and the diagnoses made were: gastroenteritis, viral infection, bronchiolitis, and vomiting. The other five (50%) were moderately ill and the diagnoses made were: viral infection (n=2), gastroenteritis (n=2), and upper respiratory tract infection (n=1).

At the final grading, three (30%) were graded 4, six (60%) were graded 3, and the baby with a hernia was considered to need hospital treatment (grade 1).

Babies scoring 20 or more

Of the four babies in this group, none was thought to be well. Two (50%) were mildly ill, one diagnosed as having an upper respiratory tract infection with conjunctivitis and the other a viral infection. Two (50%) were moderately ill. Their scores were 29 and 33. The final diagnoses made were congenital adrenal hyperplasia and bronchiolitis. At the final grading, one was graded 4 and one as grade 3. The babies scoring 29 and 33 were admitted to hospital urgently (grade 1) and the one with congenital adrenal hyperplasia received intensive care.

Discussion

The data were obtained from a small number of GPs and therefore must be interpreted with caution. Nevertheless, a number of useful points emerge. Their reactions to Baby Check were mainly positive: in 74% of cases they found it helpful, 100% would trust it, 81% said they would like to use it, 81% said they would like their health visitors and midwives to use it, and 94% said they would like parents in their practice to use the parents' version.

There were no objective criteria by which to judge whether the diagnoses, treatment, and scores were correct. In consequence we have not been able to present the sensitivity and specificity of the scores. To determine whether the scores accurately graded the severity of the babies' illnesses they were compared with the diagnoses, the doctor's initial impression of the illness, and their final grading. The initial impression was that 86% of the babies were well or mildly ill and 14% moderately ill, whereas at the end of the assessment (after they had examined the baby and seen the Baby Check score and its interpretation) the babies were considered to be sicker, 76% were considered to be well or mildly ill (grade 4), 19% suitable to be managed at home with careful observation by a capable mother, and 6% to require hospital admission (grades 1 and 2).

Baby Check has also been designed for use by parents at home, where 97% of babies score less than 8.⁶ In this study scores less than 8 occurred in 64% of babies. Baby Check advises parents that a baby with a score in this range is unlikely to need medical attention (see table 1). This study has also shown that babies with scores in this range seen by GPs were either well or had only minor illnesses, mainly upper respiratory infections or viral infections. The general practitioners considered that 89% of them were well or mildly ill although 25% were given prescriptions for thrush, conjunctivitis,

otitis media, bronchitis, and upper respiratory tract infection.

If the mothers with low scoring babies had had access to Baby Check's advice and initially sought help from their health visitor or midwife rather than their GP, most of the babies would have been treated adequately and only a few referred to the doctor. This suggests that the widespread use of Baby Check by mothers in the community could reduce the numbers of babies taken to the GP with minor problems. In their comments several GPs said they also found the score card useful to reassure mothers that their babies were not seriously ill.

Intermediate scores—that is, 8 to 19—were obtained for 31% of the babies. With a score in this range a baby may be either mildly, moderately, or seriously ill. This might be considered unhelpful because it does not give firm guidelines about decision making. However, an intermediate score alerts the GP and parents to ensure the baby is carefully observed and reassessed. The scoring system can be repeated to determine whether the score is rising or falling, and this can be used to indicate whether the baby's condition is deteriorating or improving.

This study confirms that high scores of 20 or more are uncommon and should be taken seriously. The babies assessed in this study were probably some of the illest babies seen by GPs and yet only 5% scored 20 or more. In the field trials where babies were scored by mothers at home only 0.1% of the scores done routinely were over 20.⁶ Of the four babies with high scores in this study, two with scores of 29 and 33 were admitted to hospital very ill with bronchiolitis and congenital adrenal hyperplasia, and the other two, although not admitted, had a number of worrying symptoms and signs and needed to be carefully observed at home. In the field trial of babies being scored in hospital over

90% of the babies with a score of 20 or more were considered to need admitting to hospital.⁷

The scoring system is designed to aid the assessment of acute systemic illness in babies. Clearly it would not be needed in babies with an obvious problem, such as injury, a convulsion, or failure to thrive, nor can it take account of the child's history or family circumstances. There may also be conditions that are not serious, such as thrush or conjunctivitis which still need treatment. It is designed to be used in the difficult assessment of babies with non-specific illnesses. Some doctors are inexperienced in assessing such babies. The use of Baby Check by GPs would help them to assess babies thoroughly and quantify the severity of the illness objectively.

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Copies of the Baby Check score card and booklet can be obtained from the authors.

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