Controversy surrounds the use of symphysis-fundus (S-F) measurements in the detection of small-for-gestational-age (SGA) babies. In high-risk obstetric patients S-F measurements have a high sensitivity.1-3 If a patient developed risk factors, or if S-F measurements indicated a SGA baby, she was referred to a high-risk clinic and managed accordingly. Two consecutive measurements under the 10th percentile or 3 individual measurements below the 10th percentile after 20 weeks were the criteria used to indicate a SGA baby on the S-F curve. After delivery all babies were classified according to gestational age and mass as SGA, appropriate for gestational age or large for gestational age by growth curves drawn up for our institution.4 The sensitivity (proportion of SGA babies with an abnormal S-F curve), specificity (proportion of normal babies with a normal S-F curve) and positive predictive value (likelihood of a baby being SGA if the S-F curve is abnormal) were calculated to assess the two groups. The difference between the two groups was also analysed by the chi-square test and (in the case of small numbers) by Fisher's exact test. A value of P < 0.05 was regarded as significant.

Results

The obstetric data are compared in Table I. There were no perinatal deaths in either group and the incidence of complications was similar, with the exception of preterm labour. However, most of the preterm babies were born after 34 weeks' gestation, the exceptions numbering only 1 in group A (born at 33 weeks) and 8 in group B (born between 32 and 34 weeks). All patients had a minimum of 4 S-F measurements.

In group A, 14 of the 97 babies were SGA; of these 12 were detected by the S-F curve. However, there were also 9 babies falsely identified as SGA, 1 being preterm. In group B, 12 of the 126 babies were SGA, of which only 5 were detected by the S-F curve. There were also 9 false-positives in this group; 6 of these babies were preterm. The sensitivity, specificity and growth curve1 was used. If a patient developed risk factors, or if S-F measurements indicated a SGA baby, she was referred to a high-risk clinic and managed accordingly. Two consecutive measurements under the 10th percentile or 3 individual measurements below the 10th percentile after 20 weeks were the criteria used to indicate a SGA baby on the S-F curve. After delivery all babies were classified according to gestational age and mass as SGA, appropriate for gestational age or large for gestational age by growth curves drawn up for our institution.4 The sensitivity (proportion of SGA babies with an abnormal S-F curve), specificity (proportion of normal babies with a normal S-F curve) and positive predictive value (likelihood of a baby being SGA if the S-F curve is abnormal) were calculated to assess the two groups. The difference between the two groups was also analysed by the chi-square test and (in the case of small numbers) by Fisher's exact test. A value of P < 0.05 was regarded as significant.

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predictive values of the groups are shown in Table II. The proportion of SGA babies correctly diagnosed in group A (86%) is significantly larger than that in study group B (42%) \( (P = 0.025) \). If the preterm babies are excluded the only other difference to emerge is an increase in the positive predictive value in group B.

**Discussion**

In this study two groups of low-risk obstetric patients of comparable age and gravidity were followed up in the same manner, the only exception being that group A patients were seen by the same midwife at each visit, while those in group B were seen by several midwives. The S-F growth curve was much more effective in detecting SGA babies in group A (sensitivity 85.7%) than in group B (sensitivity 41.2%). The positive predictive value of the findings was also better in group A (87.1%) than in group B (35.7%). We believe that this is due to inter-observer variability, which can be considerable, as previously shown. It is important to note that the higher proportion of preterm babies in group B did not affect the sensitivity of the S-F measurements, and this does not explain the difference between the two groups.

Our finding that S-F measurements were effective in detecting SGA babies in a low-risk population is in contrast to the findings of Rosenberg et al., and Persson et al.; numerous observers were used in both these studies. This factor was excluded in our group A. The results for our group B, however, with numerous observers, were very similar to those of Rosenberg et al. and Persson et al.

The reason for the significant difference in the incidence of preterm labour between the two groups is not clear. The incidence of preterm labour in the population from which the study groups were drawn is 19%. Group B is thus more representative of the population. The random allocation may not have been strictly adhered to, resulting in selection of patients in group A. An alternative explanation is that in group A a strong bond between patient and midwife was established, enabling better communication and thus earlier detection of risk factors by the midwife and better education of the patient. Papiernick has shown that the incidence of preterm labour can be decreased by educating patients and changing their lifestyles.

These findings clearly indicate the desirability of restructuring antenatal care towards the maximum individualised care possible. In many rural clinics and private practices this is already the case, since they are usually only staffed by one or two midwives or, in the case of practices, general practitioners or specialists. Midwives, and other practitioners not familiar with the technique, could be taught to use S-F measurements to help identify babies at risk. This will lead to appropriate individualised care and lower perinatal mortality.

The problem of establishing individualised care really lies in the urban areas, where clinics are large and the obstetric staff is relatively large and tends to change frequently. The advantages of individualised care, namely better patient education and motivation and better detection of risk factors, warrant an urgent new look at the administration of the urban antenatal clinics.

We thank the midwives of our community clinics for their help in this study, Dr A. Ferreira and Mrs D. Grové for helping collect the data, Dr B. G. Lindeque for his help in preparing the manuscript, and Mrs H. Kruger for typing the manuscript.

**REPRESENTIONS**


**TABLE II. COMPARISON OF THE VALUE OF THE S-F MEASUREMENTS IN PREDICTING SGA BABIES BETWEEN GROUP A AND GROUP B**

<table>
<thead>
<tr>
<th>Group</th>
<th>SGA AGA</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
<th>Positive predictive value (%)</th>
<th>Negative predictive value (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>S-F+</td>
<td>12 9</td>
<td>85.7</td>
<td>89.2</td>
<td>57.1</td>
</tr>
<tr>
<td></td>
<td>S-F-</td>
<td>2 74</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group B</td>
<td>S-F+</td>
<td>5 9</td>
<td>41.7</td>
<td>92.1</td>
<td>35.7</td>
</tr>
<tr>
<td></td>
<td>S-F-</td>
<td>7 105</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

AGA = appropriate for gestational age; S-F+ = S-F measurements predicted a SGA baby; S-F- = S-F measurements did not predict a SGA baby.