Introduction

Determining the fetal gestational age, lie and presentation are essential for managing and planning pregnancy care. Leopold’s* four maneuvers are to determine fetal orientation. This systematic approach has a great deal of information about the fetus: the fetal pole occupying the fundus, the position of the fetal back, the presenting part and its engagement, and fetal attitude. These maneuvers have become one of the core skills for medical students and residents to acquire during their training. The American College of Obstetricians and Gynecologists (ACOG) recommends Leopold’s maneuvers and the measurement of uterine fundus as the primary method for clinical estimation of fetal weight.1 However, its sensitivity and specificity are variable.2 Moreover, its accuracy depends on the examiner’s experience.3 In this study we aim to determine how common Leopold’s maneuvers are in current obstetrical practice.

Materials and Methods

A questionnaire was distributed among obstetricians attending the 7th Congress of Perinatal Medicine (Zagreb, Croatia, 21–24 September, 2005), 15th World Congress on Ultrasound in Obstetrics & Gynecology (Vancouver, Canada, 25–29 September, 2005) and Ian Donald Congress (Doha, Qatar, 4–8 January, 2006).
mographics included current post, country of certification of specialization and number of years in practice (obstetrics). In addition, a serial of statements examining how frequent the obstetrician performs symphysis fundal height (SFH) measurement, Leopold’s maneuvers and ultrasound examination for fetal orientation were recorded. The options provided for these statements were as follow. A: maneuver is never used; B: rarely used (only in 25% of patients); C: occasionally used (in 50% of patients); D: often used (in 75% of patients); E: always used (in 100% of patients).

Results

A total of 165 obstetricians properly completed the questionnaire. Respondents were from 15 different nationalities (Table 1). Eighty eight (53.3%) respondents were practicing general obstetrics and gynecology, whereas 45 (27.3%) were of maternal fetal medicine interest (Table 2). The mean years in obstetrics practice was 13.3 years (95% CI, 12.0-14.6).

Only 56 (33.9%) respondents indicated that they always assess the uterine size by measuring the symphysial fundal height, compared to 81 (48.5%) respondents who palpate the abdomen to determine uterine size. The first and third Leopold’s maneuver were the most frequent performed grips, 93.3% and 92.7%, respectively. The first Leopold’s maneuver was the most regular (always) performed grip (72.7%). The second pelvic grip was the least frequent (39.4%) maneuver performed (Figures 1–4). Only 36 (21.8%) respondents indicated that they regularly perform all four Leopold’s maneuvers. Seventy seven (46.7%) respondents use ultrasound to determine fetal lie, position or presentation. Thirty two (19.3%) respondent use ultrasound with every pregnant woman they examine (Figure 5). Three (1.8%) respondents determine fetal orientation exclusively by ultrasound.

The use of ultrasound was related to years of practice. The number of respondents who never used ultrasound

Table 1. Origin of certification of respondents

<table>
<thead>
<tr>
<th>Country</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle East</td>
<td>60 (36.4%)</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>40 (24.2%)</td>
</tr>
<tr>
<td>Other European countries</td>
<td>23 (13.9%)</td>
</tr>
<tr>
<td>Indian Subcontinent</td>
<td>22 (13.3%)</td>
</tr>
<tr>
<td>North America</td>
<td>14 (8.6%)</td>
</tr>
<tr>
<td>South America</td>
<td>4 (2.4%)</td>
</tr>
<tr>
<td>Australia / New Zealand</td>
<td>2 (1.2%)</td>
</tr>
</tbody>
</table>

Table 2. Type of training of respondents

<table>
<thead>
<tr>
<th>Type of training</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Obstetrics and Gynecoogy</td>
<td>88 (53.3%)</td>
</tr>
<tr>
<td>Maternal-fetal medicine</td>
<td>45 (27.3%)</td>
</tr>
<tr>
<td>Infertility</td>
<td>22 (13.3%)</td>
</tr>
<tr>
<td>Ultrasound</td>
<td>10 (6.1%)</td>
</tr>
</tbody>
</table>

![Figure 1. Percentage of respondents performing Leopold’s first maneuver](image1)

Explantion – tumačenje. Y axis: per cent, x axis: frequency of usage of Leopold’s maneuver – učestalost korištenja Leopoldovih hvatova: A. never – nikad; B. rarely – rijetko (25%); C. occasionally – povremeno (50%); D. often – često (75%); E. always – uvijek (100%)

![Figure 2. Percentage of respondents performing Leopold’s second maneuver](image2)

Explantion like in Figure 1. – Tumačenje kao u slici 1.

![Figure 3. Percentage of respondents performing Leopold’s third maneuver](image3)

Explantion like in Figure 1. – Tumačenje kao u slici 1.
Ultrasound was more regularly used by respondents with ultrasound and maternal fetal medicine interest (25.5%) than by general obstetrician and gynecologist (14.7%). However, this was not statistically significant. Ultrasound was significantly more regularly used by respondents from North America (p=0.02) than by those from the Indian subcontinent (Figure 6).

**Discussion**

Leopold’s maneuvers remain a popular method for assessing fetal attitude, lie, position and presentation. Its accuracy depends mainly on the experience of the examining physician.\(^4\) This is particularly true in identifying the upper most border of the uterine fundus.\(^5\) Its sensitivity is not related to maternal height, maternal body mass index, parity, gestational age, placental position or fetal presentation.\(^6\)

Although the impact of symphysial-fundal height (SFH) measurements on prenatal outcome remains controversial, it has replaced, in many settings, abdominal palpation.\(^7\) The symphysis fundal measurement is more accurate than abdominal palpation in estimating the gestational age.\(^8\) And yet, only 33.9% of the respondents indicated that they regularly measure the SFH. The poor sensitivity of abdominal palpation is due to three main factors. First, finger breadth is inaccurate in measuring a distance between two landmarks. Second, the anatomical position of the umbilicus varies among mothers. Finally, the gestational age at which the uterine fundus reaches the umbilicus varies among pregnant women.

The first and third maneuvers were the most regularly performed grips. The reason for this might be that they provide most of the required information, particularly fetal lie, presentation, and engagement. In contrast, the forth maneuver was the least performed grip among the respondents. This might be due to uncomfortableness of the method, or because it does not provided any significant additional information to the obstetrician.
More than a third of the respondents indicated that they use ultrasound to determine fetal orientation. This trend will most likely increase in the coming years. The availability of ultrasound machines might explain the significantly higher usage of ultrasound among North American obstetricians compared to those from the Indian Subcontinent. The high rate of ultrasound usage among respondents with less than 10 years of practice compared to those of more than 10 years might be due to the background training. Many residency programs, in the past decade, have included ultrasound training in their curriculum. The accuracy of ultrasound in determining fetal presentation, position and engagement compared to manual abdominal palpation might be another factor. These findings indicate that ultrasound is a common tool among obstetricians to determine fetal orientation. Indeed, for some obstetricians (1.8%), it has replaced Leopold’s maneuvers. Nevertheless, manual abdominal palpation remains a useful tool for antenatal care. In fact, Leopold’s maneuvers, when used by experienced clinicians, can be an effective and accurate screening tool, particularly in settings where ultrasound may not be readily available.

Conclusion

Abdominal palpation remains a common method to estimate the uterine size. Leopold’s maneuvers are still common in daily obstetrics practice. The first and third Leopold’s maneuver are the most frequent abdominal grips. Ultrasound is commonly used by obstetricians to determine fetal orientation.

References


Address for correspondence: Dr. Hisham M Mirghani, Department Obstetrics & Gynecology, Faculty of Medicine & Health Sciences, United Arab Emirates University, PO Box 17666, Al-Ain, United Arab Emirates. E-mail: hmirghani@uaeu.ac.ae