Pattern and mode of delivery among women attending Benha and October 6 University hospitals

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Background
Cesarean section (CS) rates have been increasing worldwide, raising the question of the appropriateness of the selection of cases for the procedure.

Aim
The aim of this study was to assess the patterns of CSs and identify the incidence of CSs among Benha and October 6 University hospitals and to identify the determinants of mode of delivery and study factors attributed to the increased CS rate among the studied women.

Participants and methods
A cross-sectional study targeted physicians delivering women attending Benha and October 6 University hospitals; 300 deliveries performed by the studied physicians were investigated. Fetal distress was the alarming sign to perform CS in 100% and 98.5% of cases in October 6 and Benha University hospitals.

Conclusion
The sex of the physicians participating in this study, male physicians were 71% and female physicians were 29%, with 100% of the physicians performing CS having an urban residence. Only 5% of physicians performing CS were specialists and 60% were residents, male physicians performing CSs were 58% and female physicians were 42%. Fetal distress was one of the main indications for performing a CS in 99% of cesarean deliveries, and the frequency of antenatal care visits was less than four visits in 81% of cases delivered by CS; 97% of CSs had a favorable outcome; 99% of CSs did not need further interventions; and 63% of CSs had no complications on admission; and the incidence rate of CS was found to be 24.7% in both the studied hospitals.

Keywords:
Keywords, antenatal care visits, incidence rate of cesarean section, mode of delivery, October 6 and Benha University hospitals

Introduction
Cesarean section (CS) rates have been increasing worldwide, raising the question of the appropriateness of the selection of cases for the procedure. The WHO states that no region in the world is justified in having a cesarean rate greater than 10–15%. The incidence of cesarean delivery has risen significantly in Egypt. It is estimated that one of every six deliveries today in Egypt is being carried out by a CS [1]. This signifies a serious cause for concern in most of the countries in the world and due to several investigations into the reasons for the rising rates in cesarean delivery, now it is an identified as emerging ‘global epidemic’ [2]. This dramatic increase raises several concerns of medical, ethical, and economic importance. Further, the public health significance of this increase is strongly debated [3]. The morbidity associated with the CS epidemic is profound and as a result, reducing cesarean deliveries is a goal of many professional organizations [4].

The aim of this study was to identify the demographic characteristics associated with variation in the pattern and mode of delivery in order to identify the determinants of mode of delivery and study factors attributed to the increase in CS rate among studied women.

Participants and methods
A cross-sectional study was done on 100 obstetric and gynecology physicians (accessible sample) without any preference to their medical degree performing deliveries for pregnant women attending Benha and October 6 University hospitals; physicians who were...
not willing to participate in the study were excluded. The physicians were familiarized with the questions in the questionnaire to be filled prior to getting in contact with any case, 300 deliveries were investigated.

An average number of deliveries in the selected hospitals during 6 months duration was identified and selected in each of the selected hospitals. The sample size of deliveries to be investigated was calculated and should not be less than 245 deliveries and 300 cases were studied. This study was conducted in Benha and 6 October University hospitals.

Pilot study
The questionnaire was done to fulfill the following objectives:

1. To give the researcher a chance to practice testing the questionnaire on a small scale (10 physicians accounting for 10% of the studied sample).
2. To make sure that the questions of the study tool are in a logical sequence, and to ascertain whether the questions are comprehensive and whether any rewarding will improve them.

The study tool was throughout a questionnaire that was formulated in English, including the following variables.

For the physicians:

1. Personal and sociodemographic data such as: sex, residence, and years of experience.
3. Mode of delivery: normal or CS.
4. Information about the outcome for both the mother and the infant.

Ethical consideration
Administrative approval of both hospitals in October 6 and Benha Universities was taken before the start of the work. In addition, informed written consent of the studied physicians who were willing to participate was taken after clarifying the study objectives and its confidentiality. Data coding, entry, validation, and analysis was done using suitable statistical program. SPSS version 16 (SPSS Inc., Chicago, Illinois, USA) using $\chi^2$-test, Fisher’s exact test, and regression analysis. Graphic presentation was done using Harvard Graphics version 3 (Software Publishing Cooperation). Descriptive statistics such as frequency tables and cross-tabulation were done.

Results
A total of 300 deliveries performed by 100 physicians were investigated with different modes of delivery; the studied male physicians were 71% and female physicians were 29%, with 100% of physicians performing CS having urban residence; male physicians performing CSs were 58% and female physicians were 42% (Table 1).

As regards the medical degree of physicians performing CS, 24% of physicians were specialists and 54% were residents (Table 2).

More than one factor was studied trying to determine the most common indications for performing CSs; fetal distress was one of the main indications for performing a CS in 99% of cesarean deliveries, and the frequency of antenatal care visits was less than four visits in 81% of cases delivered by CS, and 63% of CSs had no maternal complications on admission (Table 3).

As noted the outcome of pregnancy was favorable in 97% of CSs, with 99% of mothers needing no further interventions (Table 4).

The incidence rate for CSs was 25% (Fig. 1) in the studied hospitals (Table 5).

The incidence of CS was higher in Benha University hospital (32%) than that in October 6 University hospital (Table 6).

<table>
<thead>
<tr>
<th>Variables</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sociodemographic characteristics ($N=100$)</td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>71 (71)</td>
</tr>
<tr>
<td>Females</td>
<td>29 (29)</td>
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<tr>
<td>Residence of physicians performing CS ($N=75$)</td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>75 (100)</td>
</tr>
<tr>
<td>Rural</td>
<td>0 (0)</td>
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<tr>
<td>Sex of physicians performing CS ($N=75$)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>45 (60)</td>
</tr>
<tr>
<td>Female</td>
<td>32 (40)</td>
</tr>
</tbody>
</table>

CS, cesarean section.
Cesarean delivery is an indicator for the availability and accessibility to maternal health-care services. The premise is that surgical interventions such as cesarean delivery are keys to avoid maternal mortality and morbidity due to pregnancy. Table 1 shows that 71% of the studied physicians were men and 29% were women. CSs performed by physicians with urban residence (100%) is in agreement with the Egyptian Demographic and Health Survey, 2014 [5] which revealed that cesarean deliveries were more common in urban areas. Table 1 also shows that male physicians performing CS were 58%, whereas female physicians performing CS were 42%. This is not in agreement with Ito et al. [6] that there was no significant association between physician sex and the rate of cesarean delivery as studied in a Japanese Perinatal Center. Table 2 shows that 54% of CSs were performed by residents and only 24% by specialists, which is in agreement with Ying and Qing [7], who found that there was a consistent trend for CS among younger obstetricians and gynecologists. Table 3 shows that fetal distress was the indication to perform a CS in about 99% of CS in both October 6 University hospital and Benha University hospital, which was in agreement with Abebe et al. [8] that obstructed labor (30.7%), fetal distress (15.9%), and abnormal presentation (13.4%) were the major obstetric indications for CS. Table 3 also shows that 81% of CS cases had less than four antenatal care visits during the whole pregnancy, which is in accordance with Gupta et al. [9], who stated that the coverage of four or more antenatal care visits among pregnant women has declined over time and that 97% of CS deliveries had a favorable outcome in both October 6 University hospital and Benha University hospital, respectively, in contrast with Turner et al. [10] who observed that the overall balance of risks and benefits of vaginal delivery compared with CS is difficult to determine, although there is no current evidence that vaginal delivery is the safest mode of delivery for the vast majority of women. Also seen in Table 3, 63% of CS cases in both October 6 University hospital and Benha University hospital had no complications on admission, respectively, which is in accordance with MacDorman et al. [11] stating that there is a rapid increase in the number of primary cesarean deliveries without a reported medical indication. As regards mother’s prognosis after CSs, 99% of mothers did not need further management in both October 6 University hospital and Benha University hospital (Table 4), which is in agreement with the Journal of American Medical Association [12], stating that national cesarean delivery rates of up to ∼19 per 100 live births were associated with lower maternal or neonatal mortality among WHO member states. Table 5 shows that the incidence of CS was about 25% of deliveries in both October 6 University hospital and Benha University hospital.

![Incidence of cesarean section rate.](image-url)
hospital and that the percentage is considered to be a high incidence of CS rate as seen in the WHO report [13] which stated that there is no justification for any region to have CS rates higher than 10–15%. This is also in agreement with Mylonas and Friese [14] that in Germany the rates of newborn babies that were delivered through CS were 15.31% in 1991 and by 2012 they were 31.7%, despite the fact that a medical indication was present in less than 10% of all cases. Table 6 shows a 32% incidence in Benha University hospital, which is a public hospital and 8% in October 6 University hospital, which is a private hospital which is in agreement with the study done by Joshua et al. [15] that concluded that there is a high rate of CS cases in university hospitals in the USA (21.8–37%).

**Conclusion**

Most of the CSs were performed by residents; fetal distress was the main indicator to perform CS, more than half of the CSs had no complications on admission; most of CSs had less than four antenatal care visits throughout pregnancy, and the incidence rate of CS (25%) was higher than the rate recommended by the WHO (15%) in the studied hospitals, and 32% in Benha University hospital (public hospital).

**Recommendations**

Encourage women to have at least four antenatal care visits in uncomplicated pregnancies; a more experienced physician should be responsible for taking the decision to perform a CS, with clear guidelines for the management of fetal distress.

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Nil.

**Conflicts of interest**

There are no conflicts of interest.

**References**

13. WHO. The global numbers and costs of additionally needed and unnecessary cesarean sections performed per year: overuse as a barrier to universal coverage. World Health Report Background Paper no. 30. 2010.