Study on the rate of first-time cesarean section and clinical characteristics of women at Ha Hoa Medical Center, Phu Tho Province, 2023-2024

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Summary

Objective: To determine the cesarean section (CS) rate and describe some clinical characteristics of women undergoing their first cesarean at Ha Hoa Medical Center, Phu Tho Province, during 2023–2024. *Subject and methods:* 487 medical records of women who had their first cesarean section between January 1, 2023, and December 31, 2024, at Ha Hoa Medical Center. *Method:* Descriptive cross-sectional study. *Result:* The cesarean section rate was 28.17%, with primiparous women (con so) accounting for 17.93%. The mean maternal age was 26.97 ± 6.74 years. Most pregnancies were natural, accounting for 96.1% in primiparas and 97.2% in multiparas (con rạ). Gestational age between 37 and 41 weeks accounted for 98%. The main indications for cesarean were combined factors (76.5% in primiparas, 79.7% in multiparas), and most surgeries were performed after labor onset (71.9% in primiparas, 78% in multiparas). *Conclusion:* The first-time cesarean section rate at Ha Hoa Medical Center was 28.17%, mostly among primiparous women, with combined indications being the main reason, and most procedures performed after the onset of labor.

Keywords: Primiparas, multiparas, Cesarean section.

I. BACKGROUND

The rate of cesarean section (CS) is increasing globally, currently accounting for over one-fifth (21%) of all births. Some regions report even higher rates, such as 39.3% in the Americas and 23.1% in Asia [1]. In Vietnam, the CS rate has risen rapidly over the past two decades, reaching nearly 55% at the National Hospital of Obstetrics and Gynecology in 2021 [2]. The rate at Hue Central Hospital is also relatively high, at 57.57% [3].

When appropriately indicated, cesarean section can improve maternal and neonatal outcomes and reduce morbidity and mortality. However, unnecessary CS may lead to higher hospital costs, longer hospitalization, and increased risk of complications for both mother and newborn. First-time CS is particularly important, as it significantly influences the rate of subsequent cesarean deliveries, making the evaluation of this group essential.

Ha Hoa Medical Center handles over 1,100 deliveries annually, with a relatively high CS rate. However, no study has yet evaluated the clinical characteristics and appropriateness of first-time CS at this facility. Objective: To determine the cesarean section rate and describe some clinical characteristics of women undergoing their first cesarean at Ha Hoa Medical Center, Phu Tho Province, during 2023–2024.

II. SUBJECT AND METHOD

2.1. Study subjects

2.1.1. Inclusion criteria

Live singleton pregnancy.

Primiparas or multiparas undergoing their first cesarean section.

***Received**: 26/11/2025, **Accepted**: 4/12/2025*
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Medical records containing all necessary information according to study requirements.

2.1.2. Exclusion criteria

Pregnancies terminated due to stillbirth or severe congenital malformations.

Medical records lacking required study parameters.

2.2. Time and place

From January 1, 2023, to December 31, 2024, at Ha Hoa Medical Center.

2.3. Study design

Descriptive cross-sectional study.

2.4. Sample size

All eligible cases; convenience sampling with purposive selection.

2.5. Data analysis

Data were processed and analyzed using medical statistical methods with SPSS version 25.0.

2.6. Research ethics

The study was conducted after approval by the Ethics Committee of Thai Nguyen University of Medicine and Pharmacy, according to Decision No. 43/ĐHYD-HĐĐĐ dated January 8, 2025.

III. RESULT

Table 1. Rate of first-time cesarean section among women during the study period

Year	Primary C-section in primiparas		Primary C-section in multiparas		Total primary C-sections	
	n	%	n	%	n	%
2023	174/918	18,95	95/918	10,35	269/918	29,30
2024	136/811	16,77	82/811	10,11	218/811	26,88
Total	310/1729	17,93	177/1729	10,24	487/1729	28,17

Comments: In 2023, the first-time cesarean section (CS) rate was 18.95% among primiparas and 10.35% among multiparas. In 2024, the first-time CS rate was 16.77% among primiparas and 10.11% among multiparas. The overall first-time CS rate for 2023–2024 was 28.17%.

Table 2. Distribution of study subjects by age group

Number of mothers / Age group (years)	n	%
≤ 19	53	10,9
20 - 24	166	34,1
25 - 29	109	22,4
30 - 34	81	16,6
≥ 35	78	16,0
Mean (Min - Max)	26,97 ± 6,74 (16 - 47)	
Total	487	100

Comments: The mean maternal age of the study subjects was 26.97 ± 6.74 years.

Table 3. Pregnancy characteristics of study subjects

Type of conception	Primiparas		Multiparas	
	%	n	%	%
Natural	298	96,1	172	97,2
IUI	01	0,3	0	0
IVF	11	3,6	05	2,8
Total	310	100	177	100

Comments: Among primiparas undergoing first-time cesarean section, 96.1% had natural conception, 3.6% conceived via IVF, and 0.3% via IUI. Among multiparas undergoing first-time cesarean section, 97.2% had natural conception, and 2.8% conceived via IVF.

Table 4. Gestational age at delivery of study subjects

Number of mothers / Gestational age	n	%
< 37 weeks	08	1,6
37 - 41 weeks	477	98,0
>41 weeks	02	0,4
Total	487	100

Comments: Gestational age between 37 and 41 weeks accounted for 98% of cases.

Table 5. Indications for first-time cesarean section among study subjects

Indications	Primiparas		Multiparas	
	n	%	n	%
Maternal pelvic	06	1,9	01	0,6
Maternal medical conditions	03	1,0	03	1,7
Fetal factors	28	9,0	17	9,6
Placenta	32	10,3	13	7,3
Social factors	04	1,3	02	1,1
Combined indications	237	76,5	141	79,7
Total	310	100	177	100

Comments: The main indication for first-time cesarean section was combined factors, accounting for 76.5% in primiparas and 79.7% in multiparas.

Table 6. Timing of cesarean section among study subjects

Timing of CS	Primiparas		Multiparas	
	n	%	n	%
During labor	223	71,9	138	78,0
Elective	87	28,1	39	22,0
Total	310	100	177	100

Comments: Elective (planned) cesarean section accounted for 28.1% in primiparas and 22.0% in multiparas. Cesarean sections performed during labor accounted for 71.9% in primiparas and 78% in multiparas.

Table 7. Factors associated with the indication for a first cesarean section

Factor	Subgroup	Primiparas (n=310)	Multiparas (n=177)	p
Type of conception	Natural	298 (96,1%)	172 (97,2%)	0,727
	IUI/IVF	12 (3,9%)	5 (2,8%)	
Timing of CS	Elective	87 (28,1%)	39 (22,0%)	0,176
	During labor	223 (71,9%)	138 (78,0%)	
Indications	Maternal indications	09 (2,9%)	4 (2,3%)	0,782
	Fetal factors	28 (9,0%)	17 (9,6%)	
	Placenta	32 (10,3%)	13 (7,3%)	
	Social factors	4 (1,3%)	2 (1,1%)	
	Combined indications	237 (76,5%)	141 (79,7%)	

Comment: There were no statistically significant differences between primiparas and multiparas regarding the method of conception (p = 0.727), the timing of the first cesarean section (p = 0.176), or the indication groups (p = 0.782). Combined causes accounted for the highest proportion in both groups, indicating that the decision for cesarean delivery was more often the result of multiple contributing factors rather than a single isolated cause.

IV. DISCUSSION

According to the World Health Organization (WHO), the ideal cesarean section rate is 10–15%, which optimally reduces maternal and neonatal mortality; rates above this threshold do not provide additional benefits [4]. A recent global analysis reported that the average CS rate increased from 7% in 1990 to approximately 21% in 2021 and is expected to continue rising [1]. In our study, the first-time CS rate was 28.17%, higher than the global average. However, this rate is considerably lower than that reported in some recent studies in Vietnam. For example, Hoang Thi Nam Giang et al. reported a 47.1% first-time CS rate in urban areas, nearly three times higher than our results[5]. Another study at Hanoi Obstetrics and Gynecology Hospital found a 40.7% first-time CS rate among term pregnancies without a uterine scar [6]. Internationally, Liu et al [7] reported a 36.1% first-time CS rate in Zhejiang, China, while rates in Turkey and Italy [8] were 51.1% and 37.7%, respectively. These differences highlight the influence of research context, hospital level, and population characteristics on CS rates.

Notably, in our study, the first-time CS rate among primiparas was 17.93%, nearly double that of multiparas (10.24%). This aligns with general obstetric findings that first-time mothers have a higher likelihood of CS, possibly due to complications during labor, anxiety, and limited experience with vaginal delivery, leading to a higher acceptance or request for cesarean delivery.

The mean maternal age in our study was 26.97 ± 6.74 years (range 16–47). The largest age group was 20–24 years (34.1%), followed by 25–29 years (22.4%). Adolescents (≤19 years) accounted for 10.9%, and women aged ≥35 years accounted for 16.0%. This reflects common reproductive trends in Vietnam, where the optimal childbearing age remains 20–29 years.

Table 4.1. Mean maternal age at delivery among primiparas reported by other authors

Author	Year	Mean age (years)
Tong Thi Khanh Hang [9]	2020	24,62 ± 3,98
Do Thi Nhu Quynh [10]	2021	26,8 ± 4,1
Nguyen Xuan Minh [11]	2022	24,5 ± 4,6
Hoang Thi Nam Giang [5]	2022	29,7 ± 5,1
Vu Thi Hao [12]	2024	25,36 ± 4,41
Vu Van Binh	2025	26,97 ± 6,74

In our study, as shown in Table 3.3, the majority of pregnancies were natural, accounting for 96.1% in primiparas and 97.2% in multiparas. Pregnancies conceived through assisted reproductive technologies (ART), such as IUI and IVF, were rare: among primiparas, 0.3% were IUI and 3.6% IVF, while in multiparas, no IUI cases were reported and 2.8% were IVF. This reflects the reality at Ha Hoa Medical Center, a district-level facility where ART is limited, as most IUI and IVF procedures are performed at central or specialized hospitals. Therefore, ART cases in this study were mostly women managed at higher-level centers before delivery at the study site.

Most first-time cesarean sections were performed during labor. In primiparas, 71.9% were done during labor, nearly 2.5 times higher than elective CS (28.1%). In multiparas, 78% were during labor versus 22% elective. This reflects clinical practice at the study center, where labor is generally monitored before CS is indicated, aligning with guidelines to reduce unnecessary elective cesareans.

Regarding indications for first-time CS, combined factors accounted for the highest proportion in both groups (76.5% in primiparas and 79.7% in multiparas). Fetal-related indications (e.g., placenta previa, placental abruption, oligohydramnios, polyhydramnios) were second (10.3% in primiparas, 7.3% in multiparas), emphasizing the importance of monitoring fetal conditions. Fetal factors (e.g., macrosomia, fetal distress, malpresentation) accounted for 9.0% in primiparas and 9.6% in multiparas. Uterine or pelvic factors (e.g., pelvic deformity, fibroid) were uncommon (1.9% in primiparas, 0.6% in multiparas). Maternal medical conditions (hypertension, cardiovascular disease, gestational diabetes) were low (1.0% in primiparas, 1.7% in multiparas), and social or elective reasons were minor (1.3% and 1.1%). These results indicate that most first-time CS were due to multiple combined factors, consistent with both national and international studies, reflecting the need to consider several clinical factors to maximize maternal and fetal safety.

However, CS indications are not absolute and may depend on clinical judgment. First-time CS should be carefully evaluated to ensure maternal and fetal safety and minimize unnecessary procedures (e.g., patient request without medical indication, fear of labor pain). Social and family pressures can influence CS decisions, but these are not medical indications. Therefore, careful prenatal care, labor monitoring, and timely counseling can significantly reduce unnecessary CS.

Elective CS was higher in primiparas (28.1%) compared to multiparas (22%), but the difference was not statistically significant, suggesting that the decision for elective CS may depend more on clinical factors such as maternal-fetal conditions or specific obstetric circumstances rather than parity.

The CS indication model in this study shows clinical practice aimed at minimizing unnecessary elective CS while prioritizing labor monitoring. However, the high proportion of CS during labor may increase the risk of emergency complications such as acute fetal distress or longer operative time due to deep fetal head engagement. Further evaluation of the relationship between CS timing and surgical complications is recommended to ensure optimal maternal and fetal outcomes.

The analysis showed no statistically significant differences between primiparas and multiparas in several factors related to the indication for a first cesarean section, including the method of conception, timing of surgery, and categories of indications ($p > 0.05$).

Regarding the method of conception, the majority of women in both groups conceived naturally, accounting for 96.1% in primiparas and 97.2% in multiparas. Conceptions achieved through assisted reproductive technologies (IVF/IUI) represented only a small proportion in both groups (3.9% in primiparas and 2.8% in multiparas). This difference was not statistically significant (p = 0.727), indicating that the method of conception was not a significant factor influencing differences in the indication for a first cesarean delivery between the two groups.

In terms of the timing of cesarean section, most cases in both groups were operated on after the onset of labor, accounting for 71.9% in primiparas and 78.0% in multiparas. Elective cesarean section accounted for 28.1% and 22.0% in primiparas and multiparas, respectively. However, this difference was not statistically significant (p = 0.176). These findings suggest that the decision to perform a first cesarean section was primarily based on the clinical course of labor rather than on parity status.

With regard to the indication categories, combined indications accounted for the highest proportion in both groups, with 76.5% in primiparas and 79.7% in multiparas. Single-factor indications related to maternal, fetal, placental/adnexal, or social reasons were all observed at lower rates and showed no significant difference between the two groups (p = 0.782). This reflects the clinical reality that the indication for a first cesarean section is often the result of multiple contributing factors rather than a single isolated cause. It also highlights a cautious approach taken by obstetricians when deciding to perform a cesarean section, particularly in complex or high-risk situations.

Overall, the study findings indicate that parity status (primiparas versus multiparas) is not a direct determinant of the indication for a first cesarean section. Instead, specific clinical factors in each individual case play a more decisive role. This result is consistent with both national and international studies suggesting that current cesarean section indications are increasingly multifactorial and largely dependent on the maternal–fetal condition at the time of intervention.

V. CONCLUSION

The first-time cesarean section rate in this study was 28.17%, with 17.93% in primiparas.

Most first-time CS were due to combined indications.

The mean maternal age was 26.97 ± 6.74 years, and the majority of pregnancies were natural (96.1% in primiparas, 97.2% in multiparas).

Gestational age 37–41 weeks accounted for 98% of cases.

Combined indications predominated (76.5% in primiparas, 79.7% in multiparas), indicating that most CS decisions were based on multiple simultaneous clinical factors.

Regarding timing, most CS were performed during labor (71.9% in primiparas, 78% in multiparas).

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