
A Three Year Retrospective Study of Caesarean Section Rate at Tanta University Hospitals

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Abstract: This Retrospective observational study was done to determine the actual Caesarean Section rate at Tanta University Hospitals (a tertiary care hospital). Review of all deliveries that have been conducted at Tanta University Hospitals whether Vaginal or Caesarean Section in the period from January 1, 2013 to December 31, 2015 and detection of the most common causes of the Caesarean Section. The total number of deliveries was 3592, 3342, and 3320 in the years 2013, 2014 and 2015 respectively. The Rate of cesarean section was (1049/3592) 41% in 2013, (1004/23342) 45% in 2014, and (1057/3320) 46% in 2015. The CS rate was high at Tanta University Hospital, and there was slight increase in the rate through the period of study. The most common indication for cesarean section was previous cesarean section. The conclusion is that the rate of cesarean section was so high at Tanta University Hospital and much higher than WHO recommendation for developing countries. The rate of cesarean section showed minimal but continuous rise in the past three years.

Keywords: Caesarean Section Rate, Epidemic, Tertiary Care Hospitals

1. Introduction

The incidence of Caesarean deliveries is increasing every day passing faraway beyond WHO recommended rate of 15% for all deliveries [1]. Many factors contribute for the rising rates of Caesarean delivery including maternal characteristics, malpractice, economic, social and medico-legal factors have all been reported. [2]

Other important but underestimated factors include women request, hospital system factors, obstetrician's qualification and type of care provided by insurance. All of these factors are complex, and non-separable. [3]

Caesarean delivery rates are shooting all over the world with a rate of (40.5%) in Latin America and the Caribbean region which was the highest regions with CS rates followed by Northern America with a rate of (32.3%), Oceania (31.1%), Europe (25%), Asia (19.2%) and Africa (7.3%). [4]

Cesarean birth rates are also increasing in Turkey in parallel to the developments in the world. While 6.0% of all births were realized by cesarean section in 1998, this rate has

risen to 48.1% in 2013. [5] In Japan a retrospective study done at 125 institutions and concluded that the overall CS rate was found to be 37.3%. [6]

In Australia the rate of CS was increased from 19.22% in the year 1995 to 33.6% in the year 2010. It was also reported that CS rates are higher in private hospitals than public hospitals where the CS rate was 31.8% in 2007 but, women delivered in private health insurance hospital the rate was 41.5% compared with women who delivered in public hospitals. [7]

In Egypt, WHO stated that the Caesarean section (CS) rate in Egypt was 27.6% in the year 2010. [8] According Ministry of Health and Populations reported data; more than 50% (50.8%) of all deliveries were by CS without much difference between urban and rural areas. [9, 10] The possible factors employed in the rising CS rates were fear of labour pains; misconception about genital damage after vaginal delivery; misconception about safety of CS delivery for the baby;

medico-legal issues and responsibilities if fetus was lost in normal labour, health professionals a financial issues and lower tolerance to any complications or outcomes other than the perfect baby. [11] Another non-medical factors control the time and type of delivery, for example in China, scheduling CS and choosing the time of CD delivery is linked to luck and fate for the future of the baby. [12, 13]

On the other hand, several European countries have managed to control their CS rates over time by strict management of vaginal deliveries and strict policies on requesting CS plus legal framework for medical litigation. [14, 15] Also the trend to apply vaginal birth after cesarean section decreased the rate of cesarean section. [16]

The rate is unknown at Tanta University Hospitals so we conducted this study to determine the actual rate of CS at a tertiary care hospital.

2. Materials and Methods

This study is retrospective observational study done at Department of Obstetrics and Gynecology, Patient affairs and statistics unit of Tanta University, Egypt.

The hospital is located at the center of Nile Delta and serves the population of four provinces, it has 85 beds for patients with obstetrics or gynecology problems, it serves the patients with very minimal fees, and sometimes free of charges.

It is tertiary care hospital and referral hospital for many small hospitals in four provinces for any complicated cases, or difficult case.

The records of obstetrics patients are regulated by the regulations of the hospital and every case is recorded for her age, date of admission, date of delivery, type of delivery, indication of cesarean section, gender of newborn and his health, any possible complications and the name of obstetricians who conduct the delivery.

The records of patients had been reviewed from January 1, 2013 to December 31, 2015 for number of cesarean section, number of vaginal delivery, indications of cesarean section and complications to show the actual rate of cesarean in tertiary care hospital.

This study was approved by the committee of ethics of Tanta University. The records of patients had been reviewed after permission of the ethical committee of Tanta University and with privacy and preserving every single detail about patients and doctors.

The indications of cesarean section had been grouped and classified according to its indications and according to The Modified Robson Criteria. [17, 18]

3. Results

This study was done retrospectively collecting all data about deliveries conducted at Tanta University Hospitals in the period from January, 1, 2013 till December, 31, 2015. The total number of deliveries was 3592, 3342, and 3320 in the years 2013, 2014 and 2015 respectively. The Rate of cesarean section was (1049/3592) 41% in 2013, (1004/23342) 45% in 2014, and (1057/3320) 46% in 2015.

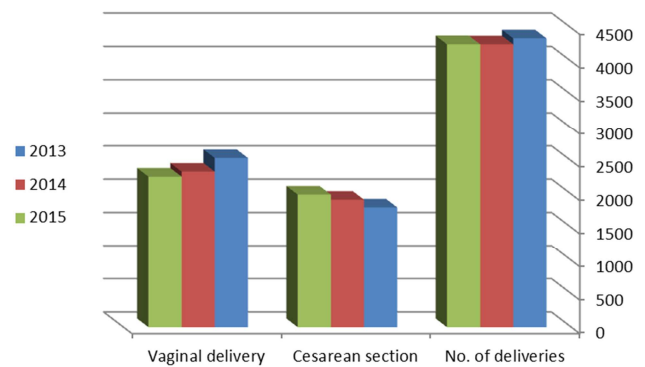


Figure 1. Shows rate of cesarean section.

The indications of cesarean due to breech presentation had been separated from other malpresentations, also the twins pregnancy had been separated from patients with high order multiple pregnancy and this had been done to be more determined in the indication of section.

The indications of medical disease of section, is any medical condition necessitate section not related to obstetrics complications like cardiac patients or cancer patients, and only single case the indication of cesarean was previous history of renal transplantation.

The most common indication of cesarean section in Tanta University Hospitals was previous cesarean section while IUGR, oligohydraminos, antepartum hemorrhage, failed trial and CPD come in second place. The least common indications were malpresentations other than breech, high order multiple pregnancies, chorioamnionitis and medical disease. Table 1

Table 1. Indications of cesarean section at Tanta University Hospitals during study period.

	2013	2014	2015
previous CS	1049 58.1%	1004 52.3%	1057 52.9%
Fetal distress	65 3.6%	56 2.9%	58 2.9%
IUGR and oligohydraminos	97 5.3%	130 6.7%	134 6.7%
Antepartum hemorrhage	86 4.7%	123 6.4%	126 6.3%
Cephalopelvic disproportion	171 9.4%	143 7.4%	144 7.2%

	2013	2014	2015
Failed trial	128 7%	174 9%	178 8.9%
Breech	58 7%	51 2.6%	58 2.9%
Other malpresentation	16 0.88%	18 0.93%	20 1%
Twins	47 2.6%	76 3.9%	78 3.9%
High order multiple pregnancy	16 0.88%	9 0.46%	6 0.3%
Chorioamnionitis	12 0.66%	13 0.67%	10 0.5%
Patient request	39 2.1%	86 4.4%	90 4.5%
Medical disease	19 1%	35 1.8%	36 1.8%

Table 2. Indications of cesarean section according to Modified Robson Criteria.

		2013	2014	2015
Group one		85	111	121
Nullipara, singleton cephalic, ≥ 37 weeks, spontaneous labour		4.7%	5.7%	6.06%
	Induced	144	137	141
Group two		7.9%	7.1%	7.06%
Nullipara, singleton cephalic, ≥ 37 weeks		167	235	236
	Caesarean section before labour	9.2%	12.2%	11.8%
Group three		43	57	62
Multipara, singleton cephalic, ≥ 37 weeks, spontaneous labour		2.3%	2.9%	3.1%
	Induced	58	84	85
Group four		3.2%	4.3%	4.2%
Multipara, singleton cephalic, ≥ 37 weeks		62	70	74
	Caesarean section before labour	3.4%	3.6%	3.7%
	Spontaneous labour	327	334	348
Group five		18.1%	17.4%	17.4%
Previous Caesarean section, singleton cephalic, ≥ 37 weeks	Induced labour	0	0	0
	Caesarean section before labour	514	499	515
		28.5%	26%	25.8%
	Spontaneous labour	23	12	15
Group six		1.2%	0.62%	0.75%
All nulliparous breeches	Induced labour	0	0	0
	Caesarean section before labour	23	15	15
		1.2%	0.78%	0.75%
	Spontaneous labour	15	12	15
Group seven		0.83%	0.62%	0.75%
All multiparous breeches (including previous Caesarean section)	Induced labour	0	0	0
	Caesarean section before labour	39	35	38
		2.1%	1.8%	1.9%
	Spontaneous labour	43	44	44
Group eight		2.3%	2.29%	2.2%
All multiple pregnancies (including previous Caesarean section)	Induced labour	0	0	0
	Caesarean section before labour	97	97	100
		5.3%	5.05%	5.01%
	Spontaneous labour	12	9	10
Group nine		0.66%	0.46%	0.5%
All abnormal lies (including previous Caesarean section but excluding breech)	Induced labour	0	0	0
	Caesarean section before labour	23	27	28
		1.2%	1.4%	1.4%
	Spontaneous labour	50	45	46
Group ten		2.7%	2.3%	2.3%
All singleton cephalic, ≤ 36 weeks (including previous Caesarean section)	Induced labour	0	0	0
	Caesarean section before labour	66	71	74
		3.6%	3.7%	3.7%

After application of Modified Robson Criteria to determine the indications of cesarean section at Tanat University Hospital we can notice that:

- Group five (spontaneous labour and before labour) is the most common group subjected to cesarean section
- Group two is the second most common group subjected

to cesarean section

- Group eight (spontaneous labour and before labour) is the third most common group.
- There is no recorded cases for induction of labour for groups five, six, seven, eight, nine and ten. Table 2

As regard complications following vaginal delivery, infection complications range from simple episiotomy infection or disruption to sever form of puerperal sepsis, genital organ injuries are vaginal tears, cervical tears and rupture uterus, also fetal complications range from simple tachypnea and low Apgar score to severe distress and intrapartum fetal loss.

Breaking episiotomy scar was the most common complication, genital tract injury was the second most common, while uterine inversion and thromboembolic complications are very rare. Table 3

Table 3. Rate of complications in patients after vaginal delivery.

	2013	2014	2015
No. of delivery	2543	2338	2263
Infection	84 3.3%	45 1.9%	33 1.4%
Hematoma	14 0.5%	12 0.5%	15 0.66%
Postpartum hemorrhage	42 1.6%	35 1.4%	33 1.4%
Breaking of episiotomy scar	225 8.8%	220 9.4%	198 8.7%
Genital organ injury	187 7.3%	158 6.7%	145 6.4%
Complete perineal tear	12 0.47%	9 0.38%	8 0.35%
Postpartum psychosis	4 0.15%	3 0.12%	4 0.17%
Retained placenta	44 1.7%	25 1.06%	47 2.07%
Uterine inversion	2 0.12%	1 0.04%	1 0.04%
Thromboembolic complications	1 0.03%	0	0
Fetal complications	64 2.5%	55 2.3%	44 1.9%

Table 4. Rate of complications in patients after caesarean section.

	2013	2014	2015
No. of delivery	1049	1004	1057
Infection	158 15%	178 17%	184 17%
Hematoma	14 1.3%	15 1.4%	10 0.9%
Postpartum hemorrhage	18 1.7%	14 1.3%	15 1.4%
Breaking of pfennestiel incision	45 4.2%	47 4.6%	32 1.6%
Urinary system injury	17 1.6%	19 1.8%	23 3.02%
Other abdominal organs injury	0	1 0.09%	0
Postpartum psychosis	1 0.09%	0	0
Hysterectomy	9 0.49%	8 0.79%	4 0.37%
Postpartum ileus	8 0.8%	4 0.39%	2 0.18%

	2013	2014	2015
Thromboembolic complications	12 0.66%	18 1.7%	24 2.2%
Anesthetic complications	12 1.1%	10 0.9%	18 1.7%
Fetal complications	25 2.3%	24 2.3%	13 1.2%

Complications of cesarean section itself not to the indications of cesarean section were infections complications range from simple wound infection to peritoneal abscess, hysterectomy complication was due to uncontrolled hemorrhage or sever injury to uterus, the hysterectomy done for placenta accrete were excluded as that hysterectomy is due to placental pathology not due to cesarean section itself, fetal complications range from simple cut injury to the baby and transient tachypnea of newborn to severe form of fetal distress.

Infection was the most common complication; breaking of pfanestiel incision is the second most common. Postpartum psychosis and abdominal organ injury other than urinary system are very rare. Table 4

4. Discussion

This retrospective observational study had been conducted at Department of Obstetrics and Gynecology, Patient affairs and statistics unit of Tanta University, Egypt. All deliveries that occurred from 1 January 2013 till 31 December 2015 were reviewed as regard patient age, parity, residence and type of delivery and any complications occurred.

There was no significant difference in the number of deliveries in the three years, and there is slight rise in the no. of cesarean section from 2013 (41%) to 2014 (45%) to reach 46% in 2015.

by comparing Tanta University Hospital's rates with other Egyptian university hospitals' rates we found that *Alaa-Eldin Ebrashy et al* (2011) determined and compared the rates and indications of CS deliveries in Cairo University Hospital and Al Mattaria Teaching Hospital they found that the rate of cesarean section was (37.8%) and (36.5%) at Cairo University Hospital and Al Mattaria Teaching Hospital respectively with the most important indication was the previous cesarean section scar and the other common indications were the cephalopelvic disproportion and failed trial [19] Another study for determining Caesarean rate at Cairo University Hospital was determined by *El Khyat et al* (2013) at 5 year period where they found that the rate of Cesarean sections was gradually increasing from 38.84% of deliveries in 2008, to 41.17% in 2012. [20]

At Ain Shams University Hospitals *Ihab Serag et al* (2014) conducted a study to evaluate the incidence of peripartum emergency hysterectomy in 5-year retrospective study starting at 2003 till end of 2008. They found that Caesarean rate increased from 31% at 2004 to 38% at 2008 at their tertiary care hospitals. [21]

Previous CS was the most important indication for CS in the past three years to be 58.1% in 2013, 52.3% in 2014 and

reach 52.9% in 2015, and the other indications make little contribution for indication of cesarean section, the second larger contribution for indication of cesarean section in 2013 was cephalopelvic disproportion 9.4%, in 2014 was failed trial 9%, in 2015 was failed trial 8.9%. Table 1

These findings were similar to that of *Alaa-Eldin Ebrashy et al* and *El Khyat et al* at Cairo University where Repeat cesarean section (RCS) was the main indication and a large proportion of patients were having previous one cesarean section with an incidence of about 43.5% in the past 5 years.[19, 20]

Betrán et al (2007) showed a 29.2% CS rate in Latin America and the Caribbean.[2] The 2008 Demographic and Health Survey in Egypt also showed that the CS rate was about 25% nationwide and 37% in urban areas. [22] More recently, Egyptian Ministry of Health and Populations estimated the general Caesarean rate in 2014 national survey which was estimated by El-Zanaty and her associates to be more than 50.8% of all deliveries which may reach up to 60% in some urban areas. [9] so there is shocking increase in rate of cesarean.

By application of Modified Robson criteria [17, 18], group five (Previous Caesarean section, singleton cephalic, ≥ 37 weeks) was the most important, either who was in spontaneous labour (2013- 18.1%),(2014- 17.4%), (2015-17.4%) or CS before labour (2013-28.5%), (2014-26%),(2015-25.8%) but there is no patients with induced labour, while group two (Nullipara, singleton cephalic, ≥ 37 weeks) are the second most important either induced labour or CS before labour. Table 2

While induced labour in group five to ten were 0% in the three years, and so there is no trial of induction of labour in Tanta University Hospitals in patients with breech presentation, other malpresentations, multiple pregnancy, previous scar and patients with IUGR or any other indication of preterm termination pregnancy, and this may account for the rising rate of CS in Tanat University Hospitals, and the application of protocol of induction of labour in the previous conditions may decrease the rising rate of cesarean section, but also may contribute to increase the rate of fetal and maternal complications. Table 2

In Egypt a study was done at Assuit University Hospitals using Modified Robson criteria where Caesarean section rate was 32% (443/1357) in 2008 and increased to 38% (626/1628) in 2011. The most common indication of CS at both time intervals was a previous caesarean delivery. Group 5 was the largest contributor (30%) to the overall CS rate, followed by Groups 1 and 4 (10% each). [23]

But Modified Robson criteria had many limitations as this classification disable the analysis of cesarean section by request [24] or even some morbid conditions as placenta previa, also neglect the analysis of some medical conditions, method used for labour induction and cause of prematurity.

The complications rate did not differ much between CS and vaginal delivery, with the commonest complication following vaginal delivery is breaking of episiotomy scar followed by genital organ injury, and the most common

complication following cesarean section was infection complications followed by breaking of pfennestiel incision. Table 4

Driul L et al (2010) had a retrospective analysis of one year of cesarean sections at the Gynecology-Obstetrics Clinic of the University of Udine during 2006 showed that cesarean sections rate was 34.5%, of which 42.1% were elective CS, 21.1% emergency antepartum CS, and 36.8% intrapartum CS. The principal reason for CS delivery was previous CS in elective CS, gestational hypertension in emergency antepartum CS, and cardiotocographic alterations in emergency intrapartum CS. [25]

Santhanalakshmi et al (2015) analyzed indications of cesarean section over a period of 4 years at the Department of Obstetrics and Gynecology Karpaga Vinayaga Institute of Medical sciences and Research center, Maduranthagam, Tamil Nadu, India where the incidence of cesarean section was 12.5%. The commonest indication for CS was repeat cesarean (43%) followed by CPD (15%). The commonest complications were primary hemorrhage and wound infection. [26]

The study has limitations, as it cannot precisely indicate the rate of cesarean section in the serving area as this retrospective study based on the record of Tanta university hospital only, but the rate of cesarean section is much higher in other private hospital with many fake indications.

Also this study lack the antenatal record of the patients, lack the financial effect of this high rate of cesarean section, neglect the successful trial of normal vaginal birth after cesarean section.

5. Conclusion

Although the rate of cesarean section was so high at Tanta University Hospitals and much higher than WHO recommendation for developing countries but still comparable to other Egyptian tertiary hospitals and to that of Egyptian Ministry of health. The rate of cesarean section shows minimal but continuous rise in the past three years so several attitudes must be taken to decrease that rate including more use of induction of labour, introduction of protocol of VBAC, health education of mother and special attention for hazards of cesarean section including placenta accreta.

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