

## Comparison of Rate of Caesarean Section between Governmental and Private Hospitals in Baghdad City

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### ABSTRACT:

#### BACKGROUND:

Rising rates of caesarean section (CS) is a worldwide concern.

#### OBJECTIVE:

Evaluating rate and indications of CS at both public and private hospital in Baghdad.

#### MATERIALS AND METHODS:

A review of all (1354) records of CS patients during January 2009 (552 public, 802 private hospitals) was performed.

#### RESULTS:

Rate of CS was higher in private (59.2%) hospital and among mothers aged 25-29 years. Younger patients and elective CS were higher among private patients, emergency CS was higher among public patients. Most CS was performed in term pregnancy, longitudinal lie in both. The most frequent indications were previous scar (previous CS) and fetal distress in both sectors, malpresentation in the public and failure to progress in the private hospital. Maternal request was found only in the private.

#### CONCLUSION:

According to the accepted rates of CS adopted by the World Health Organization (WHO) (5% - 15%); CS rate is still high in both sectors, establishing audit committee, good training with second opinion strategy are vital to reduce it.

**KEY WORDS:** caesarean section, private.

### INTRODUCTION:

In the past three decades, the rate of caesarean births has risen dramatically, and although Infant Mortality has declined during the same period, there is little evidence that more frequent CS births is the cause<sup>(1)</sup>. This increase over the years was attributed to better surgical technique, improved anaesthesia, effective antibiotics and availability of blood transfusion<sup>(2)</sup>, nevertheless in many countries, these rates have reached epidemic proportions, motivating a debate about whether the high rates are appropriate. Unnecessary caesarean section is a classic example of the mismatch between evidence and practice in obstetrics<sup>(3)</sup>.

On the one hand, some are concerned about possible additional maternal and perinatal morbidity caused by unnecessary caesarean sections. On the other hand, assessment of whether the caesarean section operation poses an intrinsic risk to the mother or the baby is difficult

<sup>(4)</sup>. Chile and Brazil (both developing countries) have the highest CS in the world (40% and 37% respectively), while Belgium and Ireland registered very low CS rate (5-12%), yet have much better maternal and neonatal outcomes<sup>(1)</sup>.

The Arab countries exhibit great disparities in their CS rates and were attributed to different demographic transition and socioeconomic development. In a study about CS rate in 18 Arabic countries, it was found that four countries had a CS rates below 5% (Yemen, Sudan, Mauritania, and Algeria), only three countries have rates above 15% (Lebanon, Qatar and Bahrain) and the rest eleven countries have CS rate between (5%-15%) these are (Palestine, Oman, Morocco, Libya, Tunisia, Saudi Arabia, United Arab Emirates, Egypt, Jordan, Kuwait and Syria)<sup>(5)</sup>.

In Iraq, the rate increased from 10% in 2000 to 16% in 2002, reaching 30% and 32% during the years 2009, 2010 respectively (including Kurdistan Region)<sup>(6,7)</sup>.

Evidence suggested that CS rate is influenced by the type of health service, whether private or public, as different rate of CS has been found in different areas of the world, In Brazil the rate of

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CS in public clinic was very low (18-19%) compared to that in private hospital 84.4%<sup>(8)</sup>. The same was found in Chilli<sup>(9)</sup> and Queensland, Australia<sup>(10)</sup>.

In Iraq, the percentage of CS in the public sector was 24.5% during 2009 increased to 25.8% during 2010, whereas in the private sectors the percentage was very much higher reaching 75.8% and 79.5% during 2009 and 2010 respectively (Kurdistan Region were not included)<sup>(6,7)</sup>. There are many successful programs carried all over the world to decrease the CS rates and substantial increase have been observed in the rates of trial of labour and vaginal delivery after a previous scar, however these changes have not been sufficient to stem the rising in CS delivery<sup>(11)</sup>.

In 1985, WHO suggested that the rate of CS should not exceed 15% since no additional benefit for the newborn or for the mother is obtained. On the other hand a rate of less than 5% would reflect difficulty in access to adequate treatment<sup>(8)</sup>.

Caesarean section was categorized into; Category 1 or emergency CS (done within 30 minutes): There is an immediate threat to the mother or the foetus, Category 2 or urgent CS (should be completed within 60-75 min), There is maternal or foetal comprise but it is not immediately life threatening, Category 3 or scheduled C/S: The mother needed earlier delivery but there is no maternal or foetal comprise, there may be concern that continuation of pregnancy is likely to affect the mother or foetus in hours or days to come and Category 4 or elective C/S: The delivery is timed to suit the mother and staff, these are cases where there is an indication for CS but there is no urgency as in mal-presentation<sup>(12)</sup>.

Regarding indications of C/S, in many cases there is more than one indication, which can be divided into foetal causes like; foetal distress, cord prolapse, gross prematurity, Mal-presentation<sup>(13)</sup>, macrosomia<sup>(14)</sup>, twin<sup>(15)</sup>, post term pregnancy<sup>(16)</sup> and decrease foetal movement where evidence indicated that decrease foetal movement late in 3<sup>rd</sup> trimester is sensitive but not specific symptoms of foetal non-wellbeing<sup>(17)</sup>.

Maternal causes like: faults in the birth canal (Cephalo-pelvic disproportion)<sup>(13)</sup>, dystocia (due to arrest of dilatation or prolongation of dilatation)<sup>(18)</sup>, pelvic tumour, cervical or vaginal stenosis, repeated CS<sup>(13)</sup>, antepartum haemorrhage (APH) (placental abruption or

placenta previa<sup>(19)</sup>, fulminating pregnancy induced hypertensions, bad obstetric history, obstructed labour<sup>(13)</sup> and CS on maternal request where traditionally it has been considered inappropriate for women to have an elective CS on request in an uncomplicated pregnancy until 1985, when the New England Journal of Medicine published an article advocating elective caesarean delivery on request, the main reason for CS on request is to avoid prolonged labour and for foetal wellbeing<sup>(20)</sup>.

It is known that unnecessary CS does more harm than good. When all is normal with the mother the CS has an eightfold higher mortality than vaginal delivery and a higher incidence of complications in subsequent pregnancies. Maternal mortality due to CS is between 6-22 deaths per 100000, half of these deaths are related to intra-operative complications while others are related to anaesthetic and postoperative complications. In recent years a shift in the aetiology of death from haemorrhage and infections to thromboembolic events was noticed<sup>(11)</sup>.

### AIMS OF THE STUDY:

1. To estimate the rate of CS to total deliveries in Al-Alwia Maternity Hospital as Public Hospital and AL-Hilal Al-Ahmer Maternity Hospital as Private Hospital.
2. To determine the indications of CS in both hospitals.
3. To determine the demographical characteristics of patient having CS in both hospitals.

### MATERIALS AND METHODS:

**Study Design;** A review of records was performed after attaining official agreement from Research Ethical Committee, Human Resources Training and Development Centre, Ministry of Health, Iraq.

### METHODS:

The study was conducted in two hospitals in Baghdad city, Al-Alwia Maternity Hospital as Public Hospital and AL-Hilal Al-Ahmer Maternity Hospital as Private Hospital, from 20 of March to 30 of May 2011 to study the demographical characteristic of patients who delivered by CS in both hospitals during January 2009, to estimate the rate of CS from total deliveries and indication of C/S in each hospital. Total deliveries during January 2009 were 1344 and 1340 in Al-Alwia and AL-Hilal Al-Ahmer hospitals respectively. All records of patients who delivered by CS during January 2009 in both hospital were included, 552 records were reviewed from Al-Alwia Maternity Hospital and

802 records from AL-Hilal Al-Ahmer Maternity Hospital.

A Checklist was prepared for collecting data including; Maternal and paternal demographic characteristics, gravidity, parity, gestational age, history of abortions, still births and neonatal death, past and present obstetrical history, medical and surgical history, foetal presentation and lie, types of CS (Elective or Emergency), indications of C/S, and pattern of CS (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> or more).

**Statistical analysis;** Data were collected and analysed using statistical package for social science (SPSS) version 16, Data were analysed

and results were tabulated, **Chi-square** and **Fisher Exact** tests were used for testing significant association for categorical variables. **P-value** less than 0.05 were considered statistically significant.

**RESULTS:**

During January 2009, the rate of CS in the studied hospitals (Al-Alwia Maternity Hospital as Public Hospital and AL-Hilal Al-Ahmer Maternity Hospital as Private Hospital) were 41.8 % and 59.2 % respectively, and it was found that type of services is significantly associated with the type of delivery ( $\chi^2 = 94.7$ , df =1, p< 0.0000) (table (1)).

**Table 1: Distribution of Types of Delivery\* by Hospitals.**

Hospital	Total Deliveries	C/S		NVD	
		No.	%	No.	%
Public	1344	552	41.8	792	59.5
Private	1340	802	59.2	538	40.5
Total	2684	1354	100	1330	100

\* The association was statistically highly significant ( $\chi^2 = 94.7$ , df=1, p=0.0000)

Regarding age; although those admitted to the private hospital were slightly younger, yet CS were higher among mothers aged (25- 29) years in both health sectors. As for mother's

occupation; in both sectors most of the patients were unemployed, but the percentage of employed mothers was significantly higher among patients in the private sector, (table (2)).

**Table 2: Distribution of Patients with CS among the Studied Hospitals by Age Groups (in years) and Occupation**

Patient's Characteristics	Public		Private	
	No	%	No	%
Age (in years)*: <19	51	9.2	84	10.5
20-24	134	24.3	219	27.3
25-29	168	30.4	227	28.3
30-34	120	21.7	155	19.3
35-39	64	11.7	81	10.1
≥40 years	15	2.7	36	4.5
Total	552	100	802	100
Mother's Occupation**				
Employed	11	2.0	120	15.0
Not employed	541	98.0	682	85.0

\* The association was statistically not significant ( $\chi^2 = 6.5$ , df=5, p= 0.26)

\*\* The association was statistically significant ( $\chi^2 = 62.9$ , df=1, p= 0.00000)

Regarding gravidity and parity; CS was more among gravida 4 and para 2 in public and among gravida 2, para 1 and primigravida in

private sector (statistically significant association) (Tables (3)).

**Table 3: Distribution of the study groups by gravidity and parity**

Gravidity & Parity	Public		Private	
	No	%	No	%
Gravidity*;				
Primi	116	21.0	236	29.4
G2	123	22.3	265	33.0
G3	150	27.2	139	17.3
G4 & More	163	29.5	162	20.3
Parity**;				
P0	116	21.0	236	29.4
P1	144	26.1	294	36.7
P2	155	28.1	143	17.8
P3	72	13.0	67	8.4
P4 & More	65	11.8	62	7.7

\* The association was statistically significant ( $\chi^2 = 48.8$ , df =3, p= 0.0000)

\*\*The association was statistically significant ( $\chi^2 = 48.5$ , df =4, p= 0.0000)

According to the pattern of CS; the frequency of previous CS were higher among patients admitted to the public sector (previous 7 versus previous 4) yet in both sectors higher rate of CS were registered as first and second CS (statistically significant association).

Gestational age was estimated from the records both according to the last menstrual period (61 and 69 in public and private respectively) or ultrasonic examination (339 and 451 in public and private respectively) and according to the decision of the treating obstetrician. It was found that the rate of CS were higher among all gestational ages in public sector, except for those with gestational

age ranging from (37-40) which was higher in the private sector.

Regarding the lie and presentation of the foetus, it was found that in both sectors most of the CS was performed among patients with longitudinal lie and cephalic presentation which was higher among patients admitted to the private sector (statistically significant association) (table (4)), and on studying the association between the type of CS performed and type of services, it was found that elective ones were higher among the private sectors and emergency CS was higher among the public sector and the association was statistically significant (table (5)).

**Table 4: Distribution of the study groups by lie and presentation**

Lie and presentation		Public		Private	
		No	%	No	%
Lie*	Longitudinal	538	97.5	791	98.6
	Transverse	14	2.5	11	1.4
Total		552	100	802	100
Presentation**	Cephalic	477	86.4	756	94.3
	Breech	61	11.1	35	4.4
	Shoulder	14	2.5	11	1.4
Total		552	100	802	100

\* The association was statistically not significant ( $\chi^2 = 2.4$ , df = 1, p= 0.118)

\*\* The association was statistically significant ( $\chi^2 = 25.2$ , df = 2, p= 0.00000)

**Table 5: Distribution of the study groups by the type of C/S\***

Type of C/S	Public		Private	
	No	%	No	%
Emergency	521	94.4	165	20.6
Elective	31	5.6	637	79.4
Total	552	100	802	100

\* The association was statistically significant ( $\chi^2 = 712.6$ , df = 1, p= 0.00000)

## RATE OF CAESAREAN SECTION

On reviewing the indications for CS, table (6) showed that previous two or more CS was the first indication in the public sector followed by previous one CS with other indication and foetal distress (34.8%, 26.6% and 11.1% respectively), whereas previous one CS alone was on the top of the list of indication in the

private sector followed by previous two CS and more (28.9% and 18.2% respectively) Maternal request, as an indication for CS was noticed among patients admitted to the private sector only and representing 7% from total indications. (The associations were statistically significant for all except for obstructed labour, failure to progress and foetal distress & other foetal causes).

**Table 6: Distribution of the study group by indication of C/S**

Indication for CS	Public		Private		P value
	No	%	No	%	
Previous two or more CS	192	34.8	147	18.3	0.000*
Previous one CS with other indication	147	26.6	78	9.7	0.000*
Foetal distress & other foetal causes	61	11.1	103	12.8	0.32* (NS)
Malpresentation	45	8.2	40	5	0.02*
Failure to progress by partogram	40	7.2	59	7.4	0.93* (NS)
PET	27	4.9	10	1.3	0.000*
Twin	10	1.8	4	0.5	0.02*
APH	9	1.6	2	0.2	0.009**
Midwife interference	8	1.5	1	0.1	0.004**
Obstructed labour	4	0.7	4	0.5	0.70** (NS)
Previous one CS	4	0.7	232	28.9	0.000*
Maternal causes	4	0.7	39	4.9	0.000*
Postdate	1	0.2	27	3.4	0.0001*
Patient request	0	0	56	7	0.000*
Total	552	100	802	100	

\*Association tested by  $\chi^2$  Test

\*\* Association tested by Fisher Exact Test

### DISCUSSION:

Among the limitation of our study we pointed out missing some important data from patient's records like indication of previous C/S, antenatal care, drug and detailed previous medical histories. The fact that this study with a retrospective view, no interviews with mothers or the obstetricians was performed and the only source for the data was the patient's records, which were often incomplete or do not reflect reality especially regarding the surgical notes. Other factors that affect CS were not included in these data such as characteristics of medical professionals regarding specialization and time of professional activity as both were not evaluated.

In the current study the rate of CS was significantly higher in private sector which was similar to the results of other researchers worldwide. In Iraq (except Kurdistan region) the rate of C/S, during 2009, was 24.57% and 74.4% in public and private sectors respectively, whereas in Baghdad city alone the rate was 33.8% and 73.5% in public and private sectors respectively<sup>(6,7)</sup>.

Same differences was found in other countries; in New York City the percentage was 21.2% and 30.4% in public and private sectors respectively<sup>(21)</sup>, in Greece the percentage in public hospitals was 41.6% and in private 53%<sup>(22)</sup>.

In Thailand the rate of CS performed in the private sector (67.3%) were more than doubled that performed in the public sector (25.7%)<sup>(23)</sup>, same result was found in Rio Grande (Brazil) during the year 2007<sup>(24)</sup>, whereas in Queensland the percentage of CS was 26% in public and 48% and private hospital<sup>(10)</sup>.

The high rate of CS in Al-Alwia Maternity Hospital compared to all Baghdad city hospitals (33.8%) can be explained by the fact that Al-Alwia Maternity Hospital is considered a referral Teaching Hospital in Al-Resafa part of Baghdad city to which most cases from other hospitals is usually referred.

The high rate of normal vaginal delivery in Al-Hilal AL-Ahmer Maternity Hospital (40.5%) in comparison with other private hospitals in Baghdad city (26.5%) can be explained by the

fact that Al-Hilal AL-Ahmer Maternity Hospital is supported by the government and also by many associations.

Regarding age groups the highest rate of CS in the current study was among age group 25-29 year in both hospitals, is in agreement with a study in Brazil where the highest rate of CS was among nearly same age group (25-30) in private sectors whereas in public sector, it was among younger age group (20-25)<sup>(24)</sup>, on the contrary, in United States of America most CS was performed among older women (35-39 year)<sup>(11)</sup>, same was found in China where the highest CS percentage was among women aged more than 37 year<sup>(25)</sup>. This difference may be due to the fact that Iraqi women are more prone for early marriage and early child responsibility which is different from developed countries due to difference in socio-cultural and religious factors.

Regarding parity most CS were performed among para2 in public sectors and para1 in private. This disagreed with the Brazilian study where the rate was higher among primigravida in both public and private (41% and 50.1%)<sup>(24)</sup>.

In the current study the rate of patients with previous CS was nearly the same in both hospitals, which disagreed with the Brazilian study, where the percentage was 18.9% in the public and (84.3%) in the private sector<sup>(24)</sup>.

Regarding pattern of CS, the 1<sup>st</sup>CS was the highest in both public and private, came in agreement with the Brazilian one<sup>(24)</sup> and with other study in Baghdad city during 2009<sup>(26)</sup>, but less was found in a study in Tikrit city – Iraq, where 2<sup>nd</sup>CS rate was the highest percentage<sup>(27)</sup>. Emergency CS was higher in public whereas elective ones were higher in private; this disagreed with a study in Baghdad city<sup>(26)</sup> where the emergency CS was only (40.2%) and in Tikrit where it was 40.2%<sup>(27)</sup>. This may be explained by the fact that Al-Alwia Maternity Hospital is considered as the Referral Teaching Hospital in the area for which most of the difficult and complicated cases are referred and usually delayed for current security situation and road traffics.

Regarding gestational age; most of CS was among term pregnancy in both health sectors, similar results were found in Baghdad and Tikrit studies<sup>(26, 27)</sup>.

Regarding indications of C/S; in the current study the most common indication was previous CS in both public and private (62.1% and 56.8%), yet previous one CS alone was the first indication in the private (28.9%), this may be explained by the fact previous one alone is

considered an absolute indication in the private sector by some obstetricians, while in the public hospital such patients would be given a trial of vaginal delivery. This agreed with previous study in Baghdad city, in which the most common indication was previous CS 48.2%<sup>(26)</sup>, also agreed with the study in Queensland<sup>(15)</sup> but disagreed with the study in Tikrit city where failure to progress was found to be the first indication<sup>(27)</sup>.

In United States America previous scar is most important indication (35%) followed by malpresentation (30%)<sup>(11)</sup>.

In China the first indication was maternal request 56.3% followed by foetal distress and failure to progress<sup>(25)</sup>.

One of the important indications was CS on maternal request; in the current study this was mentioned among patients admitted to the private hospital only (7%), whereas worldwide this indication was found to be increasing<sup>(20, 28, 29)</sup>. This could be related to fact that maternal request for CS as an indication was not registered as such in the patient's records and another indication was usually mentioned instead.

### CONCLUSION:

The rate of CS to total deliveries was high in both hospitals, yet it was higher in the private than in public, and highest among women aged 25-29 years.

Most of CS was performed around term and with cephalic presentation. Previous CS was the first indication in both hospitals, followed by foetal distress and other foetal causes. Failure to progress by partogram was the third indication in the private hospital and malpresentation was the third in public hospital, C/S on the maternal request is a frequent and new indication but was found in the private health sector only.

Emergency C/S was higher than elective in the public hospital, and the opposite was true in the private one.

Efforts to control the increase in CS rates may include; establishing audit committee to study the indications of CS and provision of good training with second opinion strategy.

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