An audit on pregnancy outcome in Al-Zahraa University Hospital Al-Azhar University during (2015)

Magdy Abd El-Mohsen Olama[1], Nahed Ezzat Mahmoud[1] and Hanan Mohammed Gaber Hassan[2]

[1]Obstetrics and Gynecology, Faculty of Medicine for Girls, Al-Azhar University, Cairo, Egypt
[2]Resident of Obstetrics and Gynecology at Bolak General Hospital, Giza, Egypt
hanangaberhikal@gmail.com

Abstract: Introduction: Obstetric practice promotes health and wellbeing of the pregnant women and her fetus. Audits are a quality improvement measure and one of the 7 pillars of clinical governance. It allows organizations to continually work toward improving quality of care by showing them where they are falling short, allows them to implement improvements. **Aim of the work:** To determine, outline and assess factor contributing to maternal mortality and morbidity especially avoidable factors in patients admitted to obstetric emergency wards in Al-Zahraa Hospital during period from 1 January 2015 to 31 December 2015. **Study design:** This is a retrospective study of all cases admitted at Al zahraa University Hospital (Emergency obstetric unit) in 2015. Population of the study: all patients who admitted to Al Zahraa Hospital in A span of one year (from 1 January, 2015, to 31 December, 2015) were enrolled in this retrospective study. There was no exclusion criteria.3454 medical records were enrolled in the study. Data were collected in case record files for statistical analysis, Inclusion Criteria; All patient admitted to obstetric wards of Al zahraa hospital during year (2015), Exclusion criteria; No cases were excluded. **Results:** Cesarean Section (55.04%), Term labour (19.77%), Post term labour (11.46%), Preterm labour (6.89%), Abortion (6.46%), Ectopic pregnancy (0.26%) and Vesicular Molecule (0.12%) of type of delivery. Emergency CS were (53%) more than elective (47%), previous CS was the commonest cause of elective CS (45%), while previous CS in labor was the commonest cause of emergency CS, post partumhaemorrhage was the commonest complication in both NVD and CS (0.75%) and (1.6%), all methods of advanced operative intervention was done, intra uterine balloon (0.2%), uterine artery ligation (0.15%), internal iliac artery ligation (0.05%), B lynch suture (0.05%) and cesarean hysterectomy (0.14%). blood transfusion was (0.8%), NICU admission was (9.9%). Types of miscarriage, Inevitable (42.60%), Incomplete (25.11%) Missed abortion (21.97%), Blighted ovum (8.97%), Septic (0.45%), The mean age group of the study was (25-30), (32.1%) The highest rate was in P1-2 (51.5%), while the lowest was in P7-9 (0.1%). The commonest medical disorder was hypertensive disorder (3.7%).

[Magdy Abd El-Mohsen Olama, Nahed Ezzat Mahmoud and Hanan Mohammed Gaber Hassan. **An audit on pregnancy outcome in Al-Zahraa University Hospital Al-Azhar University during (2015).** *Nat Sci* 2019;17(10):32-42]. ISSN 1545-0740 (print); ISSN 2375-7167 (online). http://www.sciencepub.net/nature. 5. doi:10.7537/marsnsj171019.05.

Keywords: audit; pregnancy; outcome; Al-Zahraa University; Hospital; Al-Azhar University

1. Introduction

Obstetric practice promotes health and wellbeing of the pregnant woman and her fetus. Such care entails appropriate recognition and treatment of complications, supervision of their delivery, ensuring care of newborn and management of the puerperium to include follow-up care and management of any complications, submit a tip that promote health and provide family planning options.

The obstetric practice is evaluated by many parameters as maternal and perinatal mortality and morbidity rates. Statistical analysis of all data of patients including parity, gravidity, medical disorder with pregnancy, obstetric accidents and complications, mode of delivery and others is usually done in a trial to reach to the primary causes and predisposing factors of maternal mortality and morbidity, and to achieve decline in these rates. These rates in Egypt are still far from rates recorded in developed countries.

So, an audit study on these parameters in the hospitals of our country will be very helpful in saving lives of mothers and their babies, allow safe delivery with good and rapid dealing with complications and avoiding of habhazards that may result.

Auditing is defined as the on-site verification activity, such as inspection or examination, of a process or quality system, to ensure compliance to requirements. An audit can apply to an entire organization or might be specific to a function, process, or production step. Some audits have special administrative purposes, such as auditing documents, risk, or performance, or following up on completed corrective actions. **(American society for quality, 2018)**

Other methods, such as a desk or document review audit, may be employed independently or in support of the three general types of audits.

Some audits are named according to their purpose or scope. The scope of a department or

function audit is a particular department or function. The purpose of a management audit relates to management interests, such as assessment of area performance or efficiency.

An audit may also be classified as internal or external, depending on the interrelationships among participants. Internal audits are performed by employees of your organization. External audits are performed by an outside agent. Internal audits are often referred to as first-party audits, while external audits can be either second-party or third-party. **(American society for quality,2018)**

"Clinical Audit is a quality improvement process that seeks to improve practice and outcomes through systematic review of practice against explicit criteria and the implementation of change..." New Principles of Best Practice in Clinical Audit, HQIP **(2010).**

An audit assesses if a certain aspect of health care is attaining a recognized standard. This lets care providers and patients know where their service is doing well, and where there could be improvements. The aim is to achieve quality improvement and improve outcomes for patients.

Audits are a quality improvement measure and one of the 7 pillars of clinical governance. It allows organizations to continually work toward improving quality of care by showing them where they are falling short, allows them to implement improvements, and reaudit or close the audit cycle to see if beneficial change has taken place**. (Crestopher,2017)**

Clinical audit is the process by which clinicians are able to demonstrate to themselves, their patients, hospital administrators, and healthcare financial providers the outcome and safety of their clinical practice. It is a process by which the public can be assured of safety and outcomes**. (Jonathan,2012)**

Epidemiological studies and randomized controlled trials provide insights regarding incidences, risk factors, management and outcomes, while case reviews and audits add qualitative information about the standard of care to understand the questions of 'why' and 'how to improve'. The differences between epidemiology and audit imply several methodological challenges due to divergent opinions of optimal care depending on experts, nations, locations and over time**. (Dahlke,2015)**

Audit has been an accepted and an important tool specially in obstetrics and paediatrics for the last several years.1,2 Audit is extremely important in these branches as any deficiency or deviation from the accepted standards of care may result in the loss of lives or chronic ill health for healthy women and/or their newborns. Audit differs from the other currently used methods in obstetrics such as case reviews, verbal autopsy, or confidential inquiries, to analyze maternal and/or perinatal deaths, morbidity and "near misses", while it can be an important tool to analyze these events. Although audit and research both require data collection, they essentially differ from each other; audit goes through a cycle comprising the above steps**. (Enkin M, 1989)**

Audit can be done in every health facility at any level. Some institutions periodically carryout audit specially when a change is introduced in the usual practice, while in most others, it is triggered by events like maternal / neonatal death, stillbirth, high caesarean section rates, high rates of sepsis oreclampsia or any unusual event. **(Graham W,2014)**

Audit offers many advantages. The principles of audit, if applied correctly, help to improve clinical care as well as resource allocation, budgetary and long term planning, measurement of productivity and other management issues. It can be used to assess the performance of each obstetric unit, compare between different units and as examples while setting standards or to motivate change in practice. As audit is usually initiated locally, it offers objective criteria, provides local ownership, promotes local action and is less expensive. Audit is usually non-punitive and can be used as an excellent educational tool. It can reveal deficiencies in record keeping. However, audit results cannot be generalised, and is usually not representative of other health facilities. It requires standards and intervention hence, is not suitable for primary prevention. **(Graham W,2014)**

The World Health Organization (WHO) defines near-miss morbidities as conditions/events that would have resulted in a maternal death during pregnancy, childbirth, or within 42 days after delivery if not for significant medical intervention**. (WHO,2011)**

The Centers for Disease Control and Prevention (CDC) and the American College of Obstetricians and Gynecologists (ACOG) use the term "severe maternal morbidity"(SMM) to describe unintended outcomes of labor and delivery that result in significant short- or long-term consequences to a woman's health**. (Kilpatrick SK,2016)**

In a retrospective cohort study of over 16,000 deliveries, of which 0.9 percent experienced an SMM, 44 percent of near-miss cases were identified as having opportunities for improvement**. (Ozimek JA, 2016)**

Risk factors for SMM vary between high- and low-resource countries. In a retrospective cohort study of over 67,000 deliveries in California, maternal age greater than 35 years, black race, multiple gestation, and history of a prior cesarean delivery were the major risk factors for SMM**. (Kilpatrick SJ,2016)**

The WHO has published criteria to identify women with near-miss events (table 1), a data collection tool (form 1), and a systematic approach for

evaluating these occurrences (refer to World Health Organization near-miss approach for maternal health).

The International Code of Diseases (ICD-10) definitions for maternal death and its subclassifications are described below,

• Maternal death – The death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes. ***(WHO,2004)***

Globally, the MMR was 216 maternal deaths/100,000 live births in 2015. ***(Alkema L,2016)***

MMR fell 44 percent between1990 and 2015 but with significant variation by the country's income level: 13 deaths/100,000 live births in high income countries, 180 deaths/100,000 live births in middle income countries, and 479 deaths/100,000 live births in low income countries. ***(World bank,2018)***

Egypt is not exceptional and suffers the same political setbacks affecting support of health programs, resources-related issues, and manpower problems that slow its strides towards achieving the ***Millennium Development Goals (Gebreyesus 2012)***

33.0(deaths per 100,000 live births) in 2015, maternal mortality ratio for Egypt was 33 deaths per 100,000 live births. Between 1996 and 2015, maternal mortality ratio of Egypt was declining at a moderating rate to shrink from 78 deaths per 100,000 live births in 1996 to 33 deaths per 100,000 live births in 2015. ***(Konema, 2018)***

The proportion of maternal mortality attributable to various causes varies worldwide. In a systematic analysis performed by the WHO in 2014, the leading causes of maternal death were,

- Obstetric hemorrhage (27 percent)
- Hypertensive disorders (14 percent)
- Pregnancy-related sepsis (11 percent)
- Abortion (8 percent)
- Embolism (3 percent)
- Other direct causes (10 percent; complications of delivery, obstructed labor, and all other direct causes)

Indirect causes (28 percent; preexisting medical disorders, HIV-related maternal deaths, and all other indirect causes). ***(Say L,2014)***

Aim of the work

To determine, outline and assess factor contributing to maternal mortality and morbidity especially avoidable factors in patients admitted to obstetric emergency wards in Al-Zahraa Hospital during period from 1 January 2015 to 31 December 2015.

2. Patients and methods

Study design:

This is a retrospective study of all cases admitted at Al zahraa University Hospital (Emergency obstetric unit) in 2015.

Population of the study: all patients who were admitted to Al Zahraa Hospital in A span of one year (from 1 January, 2015, to 31 December, 2015) were enrolled in this retrospective study. There were no exclusion criteria. Medical Records were enrolled in the study. Data were collected in case record files for statistical analysis.

Inclusion Criteria

All the patients admitted to obstetric emergency wards of Alzahraa University Hospital during the year (2015).

Exclusion criteria

No cases were excluded.

Revision of all data of files of patients admitted from obstetric emergency wards included:

- Name, age and parity
- Duration of pregnancy
- Ante natal care program was present or not.
- Obstetric disorders as cases of abortion, vesicular mole, disturbed ectopic pregnancy, undisturbed ectopic, ante partum hemorrhage and post partum hemorrhage.
- Pregnancy spacing, time elapsed from last pregnancy.
- Medical disorders with pregnancy as diabetes mellitus, hypertension, cardiac diseases and anemia with pregnancy.
- Mode of termination if normal, instrumental or caesarean delivery and the cause.
- Assessment of GA during termination and detection of preterm, term, post term and mode of termination.
- Mode of anesthesia.
- Personal dealing with the case (resident (senior or junior), Lecturer, Assistant Professor, Professor) i.e. surgeon qualification and the assistant.
- Labour if induced and how.
- Birth weight, and condition of fetus as assessed by Apgar score and neonatal care admission.

Then collection of every item as: number of cases with pregnancy induced hypertension, cases with diabetes mellitus and so on.

Data were analyzed and maternal mortality rate was measured by dividing the number of maternal deaths to the number of women in the reproductive age (15-50 years) in the study period according to the following equation:

MMR=Number of maternal deaths in a certain year and locality

Number of females in the child bearing period in the same year and locality.

Maternal =Number of deaths in certain year and locality

Mortality Number of live births in the same year and locality.

Ratio

- Relevant data were then processed in table forms.
- Determination of general outlines, total deliveries and total pregnant females admitted.
- Determination of percentage of every disorder and causes of each.
- Determination of cases of antepartum haemorrhage.
- Determination of rate and causes of maternal mortality.
- Determination of IUFD and Intrapartum fetal death rate and causes.

Primary outcomes:

- Maternal and perinatal mortality and morbidity indices in Alzahraa University hospital.

Secondary outcome parameters:

We searched on weak points if it is present or not and recommendations put upon the result.

1. Primary causes of maternal and perinatal mortality.
2. Predisposing factors of maternal and perinatal mortality such as lack of antenatal care, shortage of obstetric experience, late referral, late diagnosis and lack of blood.
3. Recommendations to local authorities about shortage of experienced personal, anaesthetists, and assistants as well as equipments will be done according to the results will be found.
4. Emphasizing role of peri-conceptional, antenatal, and intranatal care in minimizing maternal and perinatal mortality and morbidity.
5. Re evaluation of guide lines of the department for dealing with each emergency group of cares and re introduction, and any part will need modification the part will deal with.

Data management and statistical analysis

Data were collected, coded, revised and entered to the statistical package for Social Science (IBM SPSS) version 20. The data were presented as number and percentages for the qualitative data, mean, standard deveations and ranges for the quantitative data with parametric distribution and median with inter quartile ranges (IQR) for the qualitative data with non-parametric distribution.

Recorded data were analyzed using the statistical package for social sciences, version 20.0 (SPSS Inc., Chicago, Illinois, USA). Quantitative data were expressed as mean± standard deviation (SD). Qualitative data were expressed as frequency and percentage.

Chi-square test of significance was used in order to compare proportions between two qualitative parameters.

1. The confidence interval was set to 95% and the margin of error accepted was set to 5%. So, the p-value was considered significant as the following:

Probability (p-value)

- p-value was considered significant.
- p-value was considered as highly significant.
- p-value was considered insignificant.

3. Results

Table (1): Type of pregnancy termination distribution of the study group.

Type of delivery	No.	%
Cesarean Section	1879	54.7%
Term vaginal delivery	682	19.9%
Post term vaginal delivery	396	11.5%
Preterm vaginal delivery	237	6.9%
Miscarriage	225	6.6%
Ectopic pregnancy	9	0.3%
Vesicular Molecule	4	0.1%
Total	3432	100.00%
Chi square test	X^2	38.560
	P value	0.001 (HS)

This table shows that there was highly statistically significant increase in cesarean section regarding studied group

Table (2): Age (years) distribution of the study group.

Age (years)	No.	%
≤20 years	361	10.5%
>20-25 years	945	27.5%
>25-30 years	1102	32.1%
>30-35 years	697	20.3%
>35-40 years	287	8.4%
>40 years	40	1.2%
Total	3432	100.00%
Chi square test	X^2	45.879
	P value	0.001 (HS)

Age ranged from 15 to 53 years. The mean age was (25-30) years, 1102 cases (32%) and 40 cases (1.2%) were above 40 years

Range age 15-53 with Mean±SD 27.86±5.67, *P* value 0.001

This table shows that there was highly statistically significant increase in age (25-30) regarding studied group

Table (3): Parity distribution of the study group.

Parity	No.	%
PG	772	22.5%
P1-2	1757	51.5%
P3-4	773	22.5%
P5-6	127	3.7%
P7-9	3	0.1%
Total	3432	100.00%
Chi square test	X^2	36.862
	P value	0.001 (HS)

The parity ranged from PG to P9. The higher group was (P 1-2), 1757 cases, where 3 cases was above P 7.
P value 0.001
This table shows that there was highly statistically significant increase in parity (p1-2) regarding studied group

Table (4): the mean and median of the variables, gravidity, parity, age and duration of pregnancy

	Gravidity	Parity	Age	Duration of pregnancy
Mean	3.049	1.713	27.85	36.256
Median	3.000	2.000	27.00	38.000
ST deviation	1.6442	1.3794	5.681	7.2020
Minimum	1.0	0.0	15	4.0
Maximum	14.0	10.0	53	42.0
Percentiles25	2.000	1.000	24.00	37.000
50	3.000	2.000	27.00	38.000
75	4.000	3.000	32.00	39.000

Mean of gravidity is 3.049 with range from 1 to 14, mean of parity is 1.713 with range from 0 to 10, mean of age is 27.85 with range from 15 to 53 and mean of duration of pregnancy is 36.256 with range from 4 to 42

Table (5): Medical disorders distribution of the study group.

Medical disorders	No.	%
Hypertensive disorders	127	3.7%
Diabetes mellitus (gestational-pregestational)	68	2%
Cardiac disorders (Rehmatic heart-valve problem-heart failure)	74	2.2%
Anti partumhaemorrhage	19	0.6%
Iron deficiency Anemia	14	0.4%
Epiliptic	5	0.1%
Bronchial Asthma	81	2.4%
Autoimmune disorders	9	0.3%
Thyroid disorders	9	0.3%
No	3026	88.2%
Total	3432	100%
Chi square test	X^2	1.024
	P value	0.001 (HS)

This table shows that there was highly statistically significant decrease in medical disorder regarding studied group

Table (6): Classification of hypertensive groups of the sample

	frequency	percent
Chronic hypertension	54	42.5%
Pregnancy induced hypertension	58	45.7%
Preeclampsia	15	11.8%
Total	127	100.0%
Chi square test	X^2	14.568
	P value	0.065 (NS)

This table shows that there was statistically significant increase in preeclampsia of hypertensive groups regarding studied group

Table (7): Cause of cesarean section distribution of the study group.

Cause of CS	No.	%
Elective	880	46.9%
Emergency	999	53.1%
Total	1879	100.00%
Chi square test	X^2	24.598
	P value	0.024 (S)

This table shows that there was statistically significant increase in emergency cesarean section regarding studied group

Table (8): The cause of cesarean section distribution of the study group

Elective		
Previous	848	45.2%
Precious baby	20	1.10%
History of classical repair	2	0.10%
History of cervical tair in last vaginal delivery	6	0.31%
Grand multipara for tubal ligation	1	0.1%
Myasthenia Gravis of the mother	2	0.10%
History of shoulder dystocia	1	0.05%
Total	880	45.81%
Chi square test	X^2	57.535
	P value	0.001 (HS)
Emergency		
Previous In Labor	324	17.2%
Fetal Distress	203	10.8%
Failed Induction	12	0,68%
Arrested Partogram and CPD	125	6.62%
Cord presentation	2	0.10%
Obstructed labor	18	1%
Mal Presentation	103	5.5%
Antepartum Haemorrhage	19	1%
Premature Rupture Of Membranes	44	2.20%
Oligohydraminos	46	2.47%
Polyhydraminos	11	0.57%
Previous hysterotomy	18	0.94%
Epiliptic mother	2	0.10%
Twins in labor	52	2.46%
Multiple cong anomaly of the baby	3	0.10%
Macrosomic baby	7	0.36%
chorioamnionitis	2	0.10%
IUGR	5	0.26%
Genital wart	3	0.15%
Total	999	54.1%
Chi square test	X^2	38.924
	P value	0.002(HS)

This table shows that there was highly statistically significant increase in previous section as a cause of Elective section and significant increase in previous in labor as a cause of Emergency section regarding studied group

Table (9): Surgeon qualification distribution sharing cesarean operation.

Surgeon qualification	No.	%
Assistant prof	55	2.9%
Assistant lecturer	140	7.5%
Resident	1684	89.6%
Total	1879	100%
Chi square test	X^2	24.584
	P value	0.030 (S)

This table shows that there was statistically significant increase in cases operated on by residents regarding studied group, they always have had been helped by seniors

Table (10): Induction of labor distribution of the study group.

Induction of labor	No.	%
Successful	273	95.4%
Failed	13	4.54%
Total	286	100%
Chi square test	X^2	24.540
	P value	0.033 (S)

This table shows that there was statistically significant increase in successful cases where induction of labor was done regarding studied group

Table (11): Post-partum complications distribution of the study group.

Post Partum complications of NVD	No.	%
Cervical Tear	2	0.15 %
Extension for Episiotomy	3	0.22 %
Post partumhaemorrhage	10	0.75%
No	1302	98.8%
Total	1317	100%
Chi square test	X^2	26.593
	P value	0.026 (S)
Post partum complications of CS	No	%
Haematoma in the uterus or round ligament	7	0.36%
Angle Extension	14	0.73%
Bladder Injury	2	0.10%
Rupture varicose vein	2	0.10%
ICU admission	25	1.31%
Chi square test	X^2	35.698
	P value	0.035 (S)
Post Partum He	32	1.68%
Intestinal injury	2	0.10%
Ruptured previous scar	9	0.47%
No	1811	95.2%
Total	1901	100%
Chi square test	X^2	36.854
	P value	0.042 (S)

This table shows that there was statistically significant increase in post partumhaemorrhage as a post partum complication regarding studied group Where 29 cases needed blood or its products transfusion

Table (12) causes of ICU admission of the cases

Medical disorder	No	%
Hypertension	9	39%
Diabetes Mellitus	5	21.7%
Post partumhaemorrhage	4	17.3%
Renal Failure	1	4.34%
Cardiac disorders	3	13%
Respiratory failure	1	4.34%
Pneumonia	1	4.34%
Epilepsy	1	4.34%
Sepsis	1	4.34%
Chi square test	X^2	35.846
	P value	0.032 (S)

This table shows that there was statistically significant increase in hypertension as a cause of ICU admission regarding studied group

4. Discussion

Obstetric practice promotes health and wellbeing of the pregnant women and her fetus. Such care entails appropriate recognition and treatment of complications, supervision of their delivery, ensuring care of newborn and management of the puerpurium to include follow-up care that promote health and provide family planning options, so the obstetricians carries an important responsibility and faces many risks during their work.

An audit as a "systematic, independent and documented process for obtaining audit evidence [records, statements of fact or other information which are relevant and verifiable] and evaluating it objectively to determine the extent to which the audit criteria [a set of policies, procedures or requirements] are fulfilled. **(American society for quality,2018)**

"Clinical Audit is a quality improvement process that seeks to improve practice and outcomes through systematic review of practice against explicit criteria and the implementation of change..."

New Principles of Best Practice in Clinical Audit, HQIP ***(2010)***

An audit assesses if a certain aspect of health care is attaining a recognized standard. This lets care providers and patients know where their service is doing well, and where there could be improvements. The aim is to achieve quality improvement and improve outcomes for patients. ***(Crestopher,2017)***

This is a retrospective study of all cases admitted at Alzahraa University Hospital (Emergency obstetric unit) in 2015, to determine, outline and assess factor contributing to maternal mortality and morbidity especially avoidable factors. to review all obstetric procedures allowed within one year duration and also explore maternal mortality and morbidity within same period and their underlying possible causes.

Globally, the MMR was 216 maternal deaths/100,000 live births in 2015. ***(Alkema L,2016)***

MMR fell 44 percent between1990 and 2015 but with significant variation by the country's income level: 13 deaths/100,000 live births in high income countries, 180 deaths/100,000 live births in middle income countries, and 479 deaths/100,000 live births in low income countries. ***(World bank,2018)***

33.0(deaths per 100,000 live births) in 2015 was the maternal mortality ratio for Egypt. Between 1996 and 2015, maternal mortality ratio of Egypt was declining at a moderating rate to shrink from 78 deaths per 100,000 live births in 1996 to 33 deaths per 100,000 live births in 2015. ***(Konema,2018)***

In this study from **table (1) & figure (1)** it was found that cesarean section rate was the highest route of termination of pregnancy by 54.7%, while the rate of normal vaginal delivery was 38.12%, the abortion rate was 6.46%,ectopic pregnancy rate was 0.26% and vesicular molar pregnancy rate 0.12%.

The use of CS has increased dramatically worldwide in the last decades particularly in middle- and high-income cou0-ntries, despite the lack of evidence supporting substantial maternal and perinatal benefits with CS rates higher than a certain threshold, and some studies showing a link between increasing CS rates and poorer outcomes**. (Lumbiganon P,2010)**

The reasons for this increase are multifactorial and not well-understood. Changes in maternal characteristics and professional practice styles, increasing malpractice pressure, as well as economic, organizational, social and cultural factors have all been implicated in this trend**. (MiJ,2014)**

In Egypt, according to the latest data, more than half of all women give birth by CS without much difference between urban and rural areas**. (MOHAP,2015)**

Some possible reasons for increasing CS rates are repeatedly reported in studies from many countries such as fear of pain; concerns about genital modifications after vaginal delivery; misconception

that CS is safer for the baby; the convenience for health professionals and also for the mother and family; fear of medical litigation and lower tolerance to any complications or outcomes other than the perfect baby**. (Hellerstein S,2015)** but this is against our study as From **table (6) & figure (6)** it was found that the rate of emergency sections was the highest by nearly **54%** so, by a difference about **10%** increase from the elective sections.

According to WHO CSs are effective in saving maternal and infant lives only when they are required for medically indicated reasons, but, rates more than 10% are not associated with reductions in maternal or neonatal mortality rates, but, in high rates more than 30% CS can cause permanent complications, disability or death, so, every effort should be made to provide CS to women in need. In this point the private cinics should be claimed for the high rate of un necessary CS.

Maternal mortality ratio for Egypt was 33 deaths per 100,000 live births. Between 1996 and 2015, maternal mortality ratio of Egypt was declining at a moderating rate to shrink from 78 deaths per 100,000 live births in 1996 to 33 deaths per 100,000 live births in 2015**.** ***(Konema,2018)***

In our study the maternal mortality was only **one case** that was 20 years old, PG,18W, with IUFD, spontaneous vaginal delivery occurred with delivery of complete placenta and membranes then the patient was admitted to the ICU unit with septicemia then septic shock, DIC and disturbed conscious level then died as clarified in **table (18) and figure (18)**

According to Egyptian Ministry of Health, maternal mortality rate is higher in upper Egypt than lower Egypt (74–61%, respectively). Moreover, the most common cause of maternal mortality in Egypt is post-partum hemorrhage (19.7%), whereas the most common indirect cause is cardiovascular disease (16%) ***(Kassebaum et al., 2014)***. while the results in this study have no mortality cases due to post partumhaemorrhage as declined in **table (14)** that showed that 29 cases received blood, plasma or backed RBCs transfusion so as to safe lives of the mothers. Also, as declined in **table (13)** different procedures so as to control bleeding were done i.e, intrauterine balloon, uterine artery ligation, internal iliac artery ligation, B lynch sutures and even subtotal abdominal hysterectomy in 2 cases to save their lives.

In sub-Saharan Africa, a number of countries halved their levels of maternal mortality since 1990. In other regions, including Asia and North Africa, even greater headway was made. Between 1990 and 2015, the global maternal mortality ratio (the number of maternal deaths per 100 000 live births) declined by only 2.3% per year between 1990 and 2015. However, increased rates of accelerated decline in maternal mortality were observed from 2000 onwards. In some countries, annual declines in maternal mortality between 2000–2010 were above 5.5% ***(Alkema L. 2016)***

There are many strategies to reduce maternal mortality rate, represented by high quality of emergency obstetric care in the form of optimization of antepartum, intrapartum, and post-partum care; effective family planning services; and standardized abortion care **(WHO, 2015).**

For the reduction of the high rate of maternal mortality in Egypt, many challenges should be overcomed, especially the availability of standardized emergency obstetric management ***(Egypt Ministry of Health, 2014).***

Women's lives can be saved by the following, All women need access to antenatal care in pregnancy, skilled care during child birth as timely management and treatment can make the difference between life and birth for both the mother and the baby, control of sever bleeding after birth should be applied by different maneouvers varying from oxytocin injection to blood transfusion and even hysterectomy, Infection should be eliminated by good hygiene and recognition of early signs with good treatment, Pre eclampsia should be detected and managed before the onset of eclampsia and other life threatening complications**. (WHO,2018)**

To avoid maternal deaths, it is also vital to prevent unwanted and too-early pregnancies, so, all women including adolescents need access to contraception, safe abortion and quality post-abortion care**. (WHO,2018)**

From **table (10) & figure (10)** the successful cases for induction were **273** cases by **95.5%,** where guideline protocols for induction of labor were used starting by prostaglandin E2 (dinoglandin), and put the patient on the partogram with follow up of the baby by putting the mother on the cardiotocography (CTG), and use of syntocynon when needed till safe labor was done, and cases of failed induction **were 12** cases by **4.5%,** which were due to arrest of failure progretion, arrest of cervical dilatation, or fetal distress expressed on the CTG or meconium stained liqure during examination and they were ended by successful cesarean sections.

According to study published in European Journal of public health found that in nulliparas and multiparas without prior CS significant, albeit, small variation between hospitals, the optimum IOL rate is not known and some of the factors influencing variation that was identified are mainly outside the control of maternity services**. (sarah_Jo,2016)**

So, clinical, sociodemographic and organizational factors all contribute to variations, but

unexplained variations possibly due to organizational factors such as hospital specific policies on IOL.

In our study according to **table (11) & figure (11),** the commonest post partum complication was post partumhaemorrhage by **1.6%**, the different causes of post partumhaemorrhage are faced in the cases from atonic PPHge to traumatic (rupture uterus, rupture previous scar, and angle extension), also different modes of manipulations was done in order to control of the bleeding like, uterine artery ligation, internal iliac artery ligation, intra uterine ballon, B lynch suture, papal intake and blood and plasma transfusion. as shown **in table (11) & figure (11).** Only in tow cases the condition was not controlled until subtotal abdominal hysterectomy was done as the first case was p2 CS with placenta previa and the second was primigravida with accident ahHHge and sever post partum HHge.

According to study done at a tertiary care hospital in Upper Egypt, significant percentage of maternal deaths (24.9%) are attributed to medical diseases not unique to pregnancy. Hepatic disorders accounted for 9.5% of maternal deaths especially acute fatty liver and acute fulminant hepatitis, while cardiac disorders came second (5.6%) attributed to high prevalence of rheumatic heart diseases among Egyptian population***. (Ahmed M. Abbas,2016)***

According to study done at Mansora University hospital from 2010-2015 During the study period (2011-2015), there was a trend for decline of MMR from 380.8 in 2011 to 145.5 per 100,000 live births in 2015***. (Abdel-Hady El-Gilany1,2017)***

Most common causes of deaths were hypertensive disorders with pregnancy (29.5%) followed by post-partum hemorrhage (21.3%) and 16.4% were due to indirect causes. ***(Abdel-Hady El-Gilany1,2017).***

hypertensive disorders of pregnancy constitute a high burden of morbidity and mortality as indicated by the morbidity and mortality indices. As noted in literature, the disorders include chronic (pre-existing) hypertension, gestational (transient) hypertension, preeclampsia/eclampsia, preeclampsia superimposed on chronic hypertension and eclampsia. Both gestational hypertension and preeclampsia/eclampsia may be associated in later life with hypertension and/or cardiovascular disease**.** thesis according to study done in **Uganda** and published in **BMC Pregnancy and Child birth BMC series,*2016.***

according to this study hypertensive disorders with pregnancy were **127** cases thy were divided as follows pregnancy induced hypertension PIH was the common by **58** cases, chronic hypertension was **54** cases and preeclampsia was **15** cases as shown in **table (6).** So, hypertensive disorders were the commonest medical disorder with pregnancy by 3.7% as shown in table (5) which is coordinated with global studies done.

Hypertensive disorders of pregnancy are public health problems globally. Global studies showed that preeclampsia and eclampsia were associated with higher rates of maternal mortality, prenatal mortality, and morbidity, preterm and small for gestational age deliveries. Women with HDP are five times more likely to have perinatal death compared with women who have no hypertensive disorders of pregnancy**. (Duley L,2009)**

Several epidemiological studies have been performed to determine the prevalence and risk factors of hypertensive disease with pregnancy as well as its subtypes. The prevalences of HDP, gestational hypertension and preeclampsia are 5.2-8.2%, 1.8-4.4% and 0.2-9.2%, respectively. **(Umesawa M,2017)**

In our study according to **table (5) & figure (5)**, medical disorders that are associated with pregnancy that may lead to habhazard effect on both mother and baby where this effect varies greatly from minor complication to very bad maternal morbidity and even maternal and neonatal mortality are described as follows, Hypertensive disorders with pregnancy was the highest by 30%, the second commonest of medical disorder was Diabetes Mellitus by 17%, the third was cardiac disorders by 6.7%, where thyroid disorders were 3.4%.

Postpartum haemorrhage is a significant contributor to severe maternal morbidity, and the leading direct cause of maternal mortality worldwide ***(WHO,2014)***.

Also in our study post partumhaemorrhage was the common complication by **32** cases where **29** cases needed blood transfusion of one or more packs, where the traumatic postpartum haemorrhage was the largest sample by **19** cases while the **10** other cases were atonic.

In many International and local studies it was revealed that the main cause of PPH is uterine atony followed by vaginal hematoma, cervical or vaginal tear, adherent placenta, uterine angle extension and retained placenta ***(Sheikh L,2011).***

In our study cases of placenta previa were**9**cases, and **3** cases low lying placenta, but the total cases of antepartum haemorrhage were **19**, and the antepartum haemorrhage is a major cause of postpartum haemorrhage.

Also according to table **(12),** ICU admission as a complication of postpartum period occurred in **26** cases where postpartum hypertension were the majority by **9** cases, then Diabetes by **5** cases, PPHge by **4** cases, cardiac cases by 3 cases and the least record were in Renal failure, Respiratory failure, pneumonia, sepsis and epilepsy by **1** case in every condition.

References

1. Abdel-Hady El-Gilany1, Ahmed Badawy2, Mahmoud Elkotb Abdelmegeed Elhusseiny3, Mohamed Alaaeldin Fetoh Elmitwalli Sarhan3,2017, A 5-year audit of maternal mortality in Mansoura University Hospital, Egypt.
2. Ahmed M. Abbas*, Mariam T. Amin, Shymaa S. Ali, Neima Z. Salem, Maternal mortality: a tertiary care hospital experience in Upper Egypt. Int J Reprod Contracept Obstet Gynecol. 2016 May.
3. Alkema L, Chou D, Hogan D, Zhang S, Moller AB, Gemmill A, et al. Lancet. 2016, Global, regional, and national levels and trends in maternal mortality between 1990 and 2015, with scenario-based projections to 2030: a systematic analysis by the UN Maternal Mortality Estimation Inter-Agency Group.
4. Alkema L, Chou D, Hogan D, Zhang S, Moller AB, Gemmill A, et al. Lancet. 2016, Global, regional, and national levels and trends in maternal mortality between 1990 and 2015, with scenario-based projections to 2030: a systematic analysis by the UN Maternal Mortality Estimation Inter-Agency Group.
5. American Society for Quality, 2017. ISO 19011:2011—Guidelines for auditing management systems.
6. Dahlke JD, Mendez-Figueroa H, Maggio L, Hauspurg AK, Sperling J, Chauhan SP, et al. (2015) Prevention and management of postpartum hemorrhage: a comparison of 4 national guidelines. Am J Obstet Gynecol.2015 Jul;213(1):76.e1-76.e10.
7. Duley L. The global impact of pre-eclampsia and eclampsia. Semin Perinatol. 2009;33(3):130–137. doi: 10.1053/j.semperi.2009.02.010. [PubMed]
8. Egypt Ministry of Health (2014). Causes of maternal mortality in Egypt. Cairo, Egypt: Ministry of Health.
9. Enkin M, Keirse M.J.C, Chalmers I., A Guide to Effective Care in Pregnancy and Childbirth Oxford University Press, first published 1989.
10. Gebreyesus TA: What will it take to eliminate preventable maternal deaths? *Lancet* 2012.
11. Graham W., Wagaaraachchi P, Penny G, Mc Caw- Binns A; et Al, Criteria for Clinical Audit of the Quality of Hospital- Based Obstetric Care in Developing Countries: Bull World Health Organ 2000; 78(5):614-20.
12. Jonathan Carter. Fast-Track Surgery in Gynaecology and Gynaecologic Oncology: A Review of a Rolling Clinical Audit. Volume 2012, Article ID 368014. 1 November 2012.
13. Kassebaum N, Bertozzi A, Coggeshall M (2014). Global, regional, and national levels and causes of maternal mortality during 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. Lancet.
14. Kilpatrick SJ, Abreo A, Gould J, Greene N, Main EK, Confirmed severe maternal morbidity is associated with high rate of preterm delivery, Am J Obstet Gynecol. 2016 Aug;215(2):233.e1-7. Epub 2016 Feb 17.
15. Kilpatrick SK, Ecker JL, - Severe maternal morbidity: screening and review, American College of Obstetricians and Gynecologists and the Society for Maternal–Fetal Medicine, Am J Obstet Gynecol. 2016;215(3): B17. Epub 2016 Aug 22.
16. Sarah J Kilpatrick,2015, Next steps to reduce maternal morbidity and mortality in the USA, .
17. Say L, Chou D, Gemmill A, Tunçalp Ö, Moller AB, Daniels J, Gülmezoglu AM, Temmerman M, Alkema L SOLancet Glob Health. 2014;2(6): e323. Epub 2014 May, Global causes of maternal death: a WHO systematic analysis.
18. Sheikh L, Najmi N, Khalid U, Saleem T: Evaluation of compliance and outcomes of a management protocol for massive postpartum hemorrhage at a tertiary care hospital in Pakistan. BMC Pregnancy Childbirth. 2011.
19. Umesawa M, Kobashi G, Epidemiology of hypertensive disorders in pregnancy: prevalence, risk factors, predictors and prognosis, Hypertens Res. 2017 Mar;40(3):213-220.
20. WHO (2015) Egypt's progress towards Millennium Development Goals. Geneva, Switzerland: World Health Organization.
21. World Health Organization, 2011 WHO Recommendations for prevention and treatment of pre-eclampsia and eclampsia.
22. World Health Organization, UNAIDS, UNICEF. Progress report. WHO; Geneva: 2011. Global HIV/AIDS response. Epidemic update and health sector progress towards universal access. 2011.

.

7/6/2019