INTRODUCTION
The incidence of severe maternal morbidity is significantly higher among women undergoing emergency C/S than those undergoing elective one, complications may be greater among women of higher-order repeat C/S and among older women.

In the past 30 years the rate of caesarean section has steadily increased from 5% to more than 20% for many avoidable and unavoidable indications. The objective of this study was to compare maternal morbidity and determine its cause in elective and emergency caesarean section.

The major threats to a woman undergoing C/S are complications in emergency C/S. Haemorrhage is a frequent complication in C/S, emergency or elective. Emergency C/S have more than 20% for many avoidable and unavoidable indications. The objective of this study was to compare maternal morbidity and determine its cause in emergency and elective caesarean section.

The rates vary widely by country, health care facility, and delivering physician, partly because of differing perceptions of its benefits and risks by health care providers as well as by pregnant women. After modification of guideline on vaginal birth after caesarean (VBAC) by ACOG the rate of VBAC decreased to 13.5% from 24% before the change. It is evident that C/S is doctor friendly, VBAC is not.

The major threats to a woman undergoing Emergency C/S (Em. C/S) are complications of anaesthesia and surgery. In Elective C/S (El. C/S) mother is well prepared preoperatively, and all criteria for surgery are tried to meet with availability of trained staff, and both maternal and foetal complications are undoubtedly less. In Em. C/S there is lack of facilities to meet all the criteria of surgery, the procedure has to be done in deficient circumstances, and elective caesarean section adversely affects the outcome. Both maternal and foetal complication are understandably more common in emergency cases.

The objectives of this study were to compare maternal morbidity and determine the causes in emergency and elective Caesarean Section.

PATIENTS AND METHODS
This was a cross-sectional comparative study conducted in Obstetrics and Gynaecology Unit III, Civil Hospital Karachi from 1\textsuperscript{st} September 2006 to 28\textsuperscript{th} February 2007 on 100 pregnant women undergoing C/S. Non probability purposive sampling was used. All expecting mothers admitted through OPD or emergency, of any age or parity undergoing C/S were recruited in the study. Patients having previous myomectomy, hysterotomy or classical C/S were excluded from the study. Patients undergoing emergency C/S were placed in group A, and those delivered by elective C/S were included in group B. Study variables were general and obstetric parameters and complications observed intra-operatively. Any postoperative complications were recorded from recovery room till patient was discharged from the ward. Results: There were 50 patients in each group. In group A, 11 (22%) were booked and 33 (66%) were referred cases. In group B, 48 (96%) were booked. The mean age in both groups was 28 years. In both groups, multigravida compared to primigravida were 78% vs 22% in group A, and 92% vs 8% in group B. Indication for C/S was previous C/S in 10 (20%) patients in group A, and 39 (78%) patients in group B, placenta previa, chorioamionitis, obstructed labour (6, 12% each); pregnancy induced hypertension and eclampsia in 5 (10%) cases in group A only. Intra-operative complications in group A were 48 (96%) vs 15 (30%) in group B ($p=0.000$). Postoperative morbidity in group A was 50 (100%) and 26 (52%) in group B ($p=0.000$). Intra-operative complication was haemorrhage in 46 (92%) cases in group A and 11 (22%) in group B. Anaesthetic complications were 40 (80%); prolonged intubation 25 (50%), aspiration of gastric contents 8 (16%), and difficult intubation 7 (14%) in group A. Ten (20%) cases had anaesthetic complications in group B. Commonest postoperative complication in both groups was anaemia in 41 (82%) and 11 (22%) cases respectively. Conclusion: Maternal morbidity is significantly higher in emergency C/S. Haemorrhage is a frequent complication in C/S, emergency or elective.

Keywords: Emergency C/S, Elective C/S, Maternal, Caesarean Section, Morbidity and Mortality
parity, clinical presentation, booked status, referral status, gestational age, past medical, surgical and obstetrical history. Complications observed intraoperatively included anaesthetic accidents, haemorrhage, PPH, transfusions, extension of tears and lacerations obstetrical hysterectomy, visceral injuries, and maternal death. Postoperative complications were recorded from recovery room till patient was discharged from the ward. Postoperative complications recorded were PPH, anaemia, transfusion, blood reaction abdominal distension, wound dehiscence, burst abdomen, reopening of abdomen, prolonged hospital stay, admission to ICU, prolonged catheterisation, UTI, infection, chest problems, VVF, DVT, DIC, and maternal death. Descriptive statistics and comparison of proportions using Chi-square were carried out.

**RESULTS**

In group A, out of 50 only 11 (22%) cases were booked, 33 (66%) were referred, 41 (82%) were emergency admission. In group B patients 48 (96%) were booked and 44 (88%) were OPD admissions. The age group in group A and group B was highest between 20–30 years in both group A and group B (80%, 92% respectively). Multiparous women compared to primipara were 78% vs 22% respectively in group A, and 65% vs 35% in group B.

In group A, commonest indication was previous 2 C/S with labour pain and scar tenderness (7, 14%) followed by obstructed labour, placenta previa, chorioamnionitis (6, 12% each). Other indications in group A were foetal distress (3, 6%), dystocia (1, 2%), CPD (2, 4%), breech in labour (2, 4%), previous 1 C/S (2, 4%), and 3 C/S (1, 2%), eclampsia and uncontrolled PH (5, 10%), ruptured uterus (4, 8%), retained 2nd twin and transverse lie (2, 4% each).

In group B, most common indication was previous 2 C/S (20, 40%), followed by previous 1 C/S (10, 20%). In group B previous 1 C/S was done with various indications like big size foetus, CPD, malpresentations, BOH etc. Other indications in group B were previous 3 or more C/S (9, 18%), CPD (4, 8%) breech (3, 6%), and BOH (1, 2%). Statistical difference was found between the two groups (Table-1, 2).

Higher rate of intra-operative complications were found in group A (48, 96%) compared to group B (15, 30%) (p=0.000). All 50 (100%) in group A had postoperative morbidity, versus 24 (48%) in group B (p=0.000). Commonest intra-operative complication was haemorrhage in 46 (92%) cases in group A and 11 (22%) in group B (p=0.000). Reasons for haemorrhage were extension of tears and lacerations 28 (56%) vs 3 (6%) (p=0.000), morbidly placed or adherent placenta and atonic uterus. Other complications were PPH in 18 (36%) vs 4 (8%) cases (p=0.001), anaesthetic complications in 40 (80%) vs 10 (20%) cases (p=0.000), need of transfusion in 46 (92%) vs 10 (p=0.000), and obstetrical hysterectomy (p=0.014). Commonest postoperative complication in both groups was anaemia in 41 (82%) and 12 (24%) cases respectively (p=0.000). Other problems were abdominal distension (p=0.001) infection, and need to admission to ICU etc.

**Table-1: Demographic status of the patients**

<table>
<thead>
<tr>
<th>Mode of Admission</th>
<th>Em. C/S n (%)</th>
<th>EL C/S n (%)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPD</td>
<td>9 (18)</td>
<td>44 (88)</td>
<td></td>
</tr>
<tr>
<td>Emergency</td>
<td>41 (82)</td>
<td>6 (12)</td>
<td></td>
</tr>
</tbody>
</table>

**Table-2: Indications of C/S (n=100)**

<table>
<thead>
<tr>
<th>Indications</th>
<th>Em. C/S n (%)</th>
<th>EL C/S n (%)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous 1 C/S</td>
<td>2 (4)</td>
<td>10 (20)</td>
<td>0.014</td>
</tr>
<tr>
<td>Previous 2 C/S</td>
<td>7 (14)</td>
<td>20 (40)</td>
<td>0.003</td>
</tr>
<tr>
<td>Previous 3 or more C/S</td>
<td>1 (2)</td>
<td>9 (18)</td>
<td>0.008</td>
</tr>
<tr>
<td>Placenta Previa</td>
<td>6 (12)</td>
<td>3 (6)</td>
<td>0.295</td>
</tr>
<tr>
<td>Chorioamnionitis</td>
<td>6 (12)</td>
<td>0 (0)</td>
<td>0.012</td>
</tr>
<tr>
<td>Obstructed Labour</td>
<td>6 (12)</td>
<td>0 (0)</td>
<td>0.012</td>
</tr>
<tr>
<td>Eclampsia + PPH</td>
<td>5 (10)</td>
<td>0 (0)</td>
<td>0.022</td>
</tr>
<tr>
<td>Ruptured Uterus</td>
<td>4 (8)</td>
<td>0 (0)</td>
<td>0.041</td>
</tr>
<tr>
<td>Foetal Distress</td>
<td>3 (6)</td>
<td>0 (0)</td>
<td>0.079</td>
</tr>
<tr>
<td>CD P</td>
<td>2 (4)</td>
<td>4 (8)</td>
<td>0.400</td>
</tr>
<tr>
<td>Retained 2nd Twin</td>
<td>2 (4)</td>
<td>0 (0)</td>
<td>0.153</td>
</tr>
<tr>
<td>Transverse Lie</td>
<td>2 (4)</td>
<td>0 (0)</td>
<td>0.153</td>
</tr>
<tr>
<td>Non progress of labour</td>
<td>1 (2)</td>
<td>0 (0)</td>
<td>0.315</td>
</tr>
<tr>
<td>Abruptio Placaeae</td>
<td>1 (2)</td>
<td>0 (0)</td>
<td>0.315</td>
</tr>
<tr>
<td>BOH</td>
<td>0 (0)</td>
<td>1 (2)</td>
<td>0.315</td>
</tr>
<tr>
<td>Breech</td>
<td>2 (4)</td>
<td>3 (6)</td>
<td>0.646</td>
</tr>
</tbody>
</table>

Table-3, and Table-4 give details of intraoperative complications with statistical differences. Need of blood transfusion both intra-operatively and postoperatively was higher in group A compared to group B (p=0.000).

**Table-3: Intra-operative maternal complications of CS (n=100)**

<table>
<thead>
<tr>
<th>Complications</th>
<th>Em. C/S n (%)</th>
<th>EL C/S n (%)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficulty in intubations</td>
<td>7 (14)</td>
<td>0 (0)</td>
<td>0.006</td>
</tr>
<tr>
<td>Prolong intubations</td>
<td>25 (50)</td>
<td>10 (20)</td>
<td>0.002</td>
</tr>
<tr>
<td>Gastric content aspiration</td>
<td>8 (16)</td>
<td>0 (0)</td>
<td>0.033</td>
</tr>
<tr>
<td>Haemorrhage</td>
<td>46 (92)</td>
<td>11 (22)</td>
<td>0.000</td>
</tr>
<tr>
<td>PPH</td>
<td>18 (36)</td>
<td>4 (8)</td>
<td>0.001</td>
</tr>
<tr>
<td>Bladder injury</td>
<td>4 (8)</td>
<td>0 (0)</td>
<td>0.041</td>
</tr>
<tr>
<td>Bowel injury</td>
<td>1 (2)</td>
<td>0 (0)</td>
<td>0.315</td>
</tr>
<tr>
<td>Tear extension and laceration</td>
<td>28 (56)</td>
<td>3 (6)</td>
<td>0.000</td>
</tr>
<tr>
<td>Obstetrical hysterectomy</td>
<td>8 (16)</td>
<td>1 (2)</td>
<td>0.014</td>
</tr>
<tr>
<td>Thrombo-embolism</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>-</td>
</tr>
<tr>
<td>Transfusion</td>
<td>46 (92)</td>
<td>10 (20)</td>
<td>0.000</td>
</tr>
<tr>
<td>Maternal death</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>-</td>
</tr>
<tr>
<td>No complication</td>
<td>2 (4)</td>
<td>35 (70)</td>
<td>0.000</td>
</tr>
</tbody>
</table>
Two types of healing failure were seen wound dehiscence and burst abdomen. Total intra-operative morbidities in group A were 48 (96%) and in group B 15 (30%) ($p=0.000$) while postoperative morbidity was 50 (100%) and 24 (48%) respectively ($p=0.000$). One patient of placenta previa of group A expired after C/S due to massive haemorrhage resulting in DIC.

**DISCUSSION**

Complex deliveries including Caesarean Section require presence of senior medical personnel and support the case for more consultants in the labour wards. This may impact on lowering the C/S rate and should improve safety for mother and baby. A hospital-based prospective study at 12 centres of 9 counters showed that maternal complications were increased by C/S but elective C/S may reduce neonatal complications. A Finland study showed that about 27% women had complications, 10% had severe. Significant independent risk factors for maternal morbidity are emergency C/S and crash Em. C/S vs El. C/S. All types of maternal complications were seen in our study. Complications were more common in emergency compared to elective C/S.

Majority of women were multipara as compared to primipara, 78% vs 22% in group A and 92% vs 8% in group B, against 50.8% primipara in a study conducted at Rawalpindi. The changing patterns in C/S rate have not been affected by change in the indications over these years. Maternal and foetal morbidity and mortality is largely dependent on the indications for which the operation is performed. It is comparatively high in placenta previa, severe PIH, eclampsia and ruptured uterus. Emergency C/S is usually performed for foetal distress, prolonged rupture of membranes, obstructed labour, severe PIH, eclampsia, ruptured uterus. Same indications were found in our study. Most common indication in present study in group A and group B was previous 2 C/S (14% and 40% respectively). In group A patients presented with labour pain, scar tenderness and impending rupture for which complications like extension of tears, lacerations, haemorrhage and bladder rupture were seen. This was not so frequent in group B. Second highest indication was obstructed labour, chorioamnionitis and placenta previa. There were other indications like ruptured uterus, foetal distress, CPD, breech, transverse lie, retained second twin, and no progress of labour. Compared to a study at Isra University repeat C/S (19.2%), dystocia (13.4%), foetal distress (12.6%) and APH (16, 11.8%). An international study showed that a women is likely to go into C/S if she is having a breech presentation 90%, or APH 85% or previous C/S 71%. In group B section were done on previous 1, 3 or more C/S making 78% others were CPD 8%, breech and placenta previa 6% each, and BOH 2% comparable with Rawalpindi study.

Overall intra-operative complications were 96% in group A and 30% in group B, it was comparable with other local studies stating 81.12% for emergency C/S and 18.9% for elective C/S, while postoperative complications were 100% in group A and 48% in group B, which was comparable to 92.6% in emergency cases in the same study. Although the number of patients was limited in our study the results were statistically significant ($p=0.000$).

The main intra-operative complications were haemorrhage 92% and transfusion 92% in group A and only 22% and 20% respectively in group B. In a local study on 526 patients 93.2% of emergency and 6.8% elective cases needed transfusion. A study from Lahore showed that intra-operative haemorrhage was the most common complication in C/S being responsible for two maternal deaths in that series. Haemorrhage is common even in low risk planned caesarean delivery. Reasons for haemorrhage were extension of tears and lacerations, adherent placenta and atonic uterus found more in group A than group B.

Intra-operative PPH were 36% in group A, and 8% in group B. In a study on 494 patients 59.46% showed intraoperative PPH. Total 9 (18%) obstetric hysterectomies were performed after failure of internal iliac artery legation. Eight (16%) in group A vs 1 (2%) ($p=0.014$). Due to atonic uterus 4 (8%) placenta previa 2 (4%) ruptured uterus 1 (2%), DIC 1 (2%) in group A. Group B patient had massive haemorrhage due to adherent placenta previa leading to DIC. All these patients were multipara or grand multipara except a 32 week primi with twins and eclampsia of group A had hysterectomy because of atomic uterus and DIC, compared to 6/889 in local study.

Other intraoperative complications like injury to adjacent viscera, difficult intubations, aspiration of

### Table 4: Post operative maternal complications of CS, (n=100)

<table>
<thead>
<tr>
<th>Complications</th>
<th>Em. CS n (%)</th>
<th>El. CS n (%)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPH</td>
<td>9 (18)</td>
<td>2 (4)</td>
<td>0.025</td>
</tr>
<tr>
<td>Anaemia</td>
<td>41 (82)</td>
<td>12 (24)</td>
<td>0.000</td>
</tr>
<tr>
<td>Abdominal distension</td>
<td>17 (34)</td>
<td>4 (8)</td>
<td>0.001</td>
</tr>
<tr>
<td>Reopening of abdomen</td>
<td>3 (6)</td>
<td>1 (2)</td>
<td>0.307</td>
</tr>
<tr>
<td>Burst abdomen</td>
<td>11 (22)</td>
<td>0</td>
<td>0.315</td>
</tr>
<tr>
<td>Wound dehiscence</td>
<td>11 (22)</td>
<td>4 (8)</td>
<td>0.050</td>
</tr>
<tr>
<td>Prolong maternal stay</td>
<td>31 (62)</td>
<td>7 (14)</td>
<td>0.000</td>
</tr>
<tr>
<td>VVF</td>
<td>1 (2)</td>
<td>0</td>
<td>0.315</td>
</tr>
<tr>
<td>Infection</td>
<td>16 (32)</td>
<td>3 (6)</td>
<td>0.001</td>
</tr>
<tr>
<td>Chest problem</td>
<td>20 (40)</td>
<td>7 (14)</td>
<td>0.003</td>
</tr>
<tr>
<td>Transfusion</td>
<td>31 (62)</td>
<td>8 (16)</td>
<td>0.000</td>
</tr>
<tr>
<td>Blood reaction</td>
<td>6 (12)</td>
<td>1 (2)</td>
<td>0.050</td>
</tr>
<tr>
<td>DVT</td>
<td>3 (6)</td>
<td>0</td>
<td>0.079</td>
</tr>
<tr>
<td>DIC</td>
<td>14 (28)</td>
<td>2 (4)</td>
<td>0.001</td>
</tr>
<tr>
<td>Maternal death</td>
<td>11 (22)</td>
<td>0</td>
<td>0.315</td>
</tr>
<tr>
<td>Admission to ICU</td>
<td>16 (32)</td>
<td>3 (6)</td>
<td>0.001</td>
</tr>
<tr>
<td>UTI</td>
<td>33 (66)</td>
<td>9 (18)</td>
<td>0.000</td>
</tr>
<tr>
<td>Prolong catheterization</td>
<td>31 (62)</td>
<td>4 (8)</td>
<td>0.000</td>
</tr>
<tr>
<td>No complication</td>
<td>0</td>
<td>26 (52)</td>
<td>0.000</td>
</tr>
</tbody>
</table>

1. Asifa.pdf

2. J Ayub Med Coll Abbottabad 2012;24(1)

3. PPH: Postpartum Haemorrhage

4. CS: Caesarean Section
gastric contents were found only in group A, might be
the result of poor surgical techniques by junior doctors.
The early availability of blood was a serious setback
towards early intervention and outcome; usually the
attendants were reluctant to donate their blood. None of
the group A operation was performed in a standard time
of 30 minutes15, reason could be delay in induction of
anaesthesia or the type of anaesthesia. Pulmonary
aspiration of gastric contents and oesophageal intubation
has high incidence in patients undergoing anaesthesia
in late pregnancy.11,12,20

The commonest postoperative complication
was anaemia in both groups as 82%, and 24%
respectively, compared to 18.6% and 4.74% in a local
study15. Second was UTI 66% vs 18% respectively
(p=0.000), as compared to 67% in Em C/S in a Nigerian
study.21

Other important post operative complications
in group A were blood transfusion, prolonged maternal
stay and prolonged catheterisation 62% each verses
significantly low in group B (p=0.000). Postoperative
infection was 32% vs 6% (p=0.001), febrile morbidity
reported in a local study was 22%.17 Wound dehiscence
was 22% in group A vs 8% in group B (p=0.050). An
Nigerian study on 205 women showed 44.4% had one or
more intra and postoperative complications, sepsis
were the commonest 70.4% only in emergency C/S,21 in
this study sepsis was 38% in 100 patients.

An international study showed that planned
C/S had less endometritis 2.2% vs planned vaginal
delivery17,22, in another international study post
operative morbidity were 35.7%, most frequent was
fever 24.6% blood loss 4% haematoma 3.5% and UTI
3%. Among these PPH remains the major cause of
maternal mortality23.

CONCLUSION
Maternal morbidity is significantly higher in emergency
C/S in terms of anaemia requiring blood transfusions,
hospital stay, and prolonged catheterisation. Haemorrhage reveals an important complication in C/S
whether emergency or elective.

REFERENCES
1. Pallasmaa N, Ekblad U, Gissler M. Severe maternal morbidity
and the mode of delivery. Acta Obstetric Gynecol Scand
2. Sobande A, Eskandar M. Multiple repeat caesarean sections:
complications and outcomes. J Obstetric Gynaecol Canada
MW, et al. Timing of elective caesarean delivery at term and
4. Sachs BP. Vaginal birth after caesarean. A health policy
5. Bragg F, Cromwell DA, Edozien LC, Girol-Urganci
I, Mahmood TA, Templeton A, et al. Variations in rates of
caesarean section among English NHS trusts after accounting
for maternal and clinical risk: cross sectional study. BMJ
2010;341:c5065.
on vaginal birth after previous caesarean delivery: major recommendations. Available at:
http://www.guidelines.gov/content.aspx?id=23583
7. Rubin R. Battle lines drawn over C-section. USA today.23-8
2005-08-23-cection-battle_x.htm
India 2006;56(4):298–300.
9. Naz F, Bagam A. Analysis of maternal complications in
10. Tighe D, Swezey S. The perioperative experience of Caesarean
birth: preparation, consideration and complication. Perinat
anesthesia work force study: twenty-years-update. Anesthesiology
12. Datta S, Kodali BS, Scott Segal S. anesthesia for caesarean
13. Chongquatvorawong V, Bachtier H, Chowdhury ME, Fernando
S, Suwanrath C, Kor-Anantakool O, et al. Maternal and fetal
mortality and complications associated with C/S deliveries in
J, Raudaskoski T, Ulander VM, et al, Caesarean delivery in
Finland; maternal complications and obstetric risk factors.
15. Tasneem A. Emergency vs planned C/S:analysis of 889 cases at
Rawalpindi General Hospital during 2001. Pak J Obstet
16. Haider G, Zehra N, Munir AA, Haider A. Frequency and
indications of C/S in a tertiary care hospital. Pak J Med Sci
17. Saadia Z, Khan AZ, Naheed F. Maternal complications associated with caesarean
mortality and severe morbidity associated with low-risk
planned cesarean delivery versus planned vaginal delivery at
19. Ruby N. Maternal complications associated with caesarean
section–one year retrospective study. J Postgrad Med Inst
20. Helmy WH, Jaloaso AS, Afify SA, Jones MH. The decision to
delivery interval for emergency sections minutes a realistic
21. Cham CM, El-Nafaty AU, Idrisa A. Caesarean morbidity
22. Geller DJ, Wu JM, Jannelli ML, Nguyen TM, Visco AG.
Maternal outcomes associated with planned vaginal vs planned
primary c/delivery. F1000: “changes clinical practice”. Am J
Interventional management for complications following C/S

Address for Correspondence:
Dr. Asifa Ghazi, Associate Professor, Obs/Gyn Unit III, Dow Medical College & Civil Hospital Karachi, Pakistan.
Cell: +92-300-9209028
Email: achiamme@gmail.com

http://www.ayubmed.edu.pk/JAMC/24-1/Asifa.pdf