Evaluation of the Use vs Non Use of Urinary Catheterization During Cesarean Delivery: Randomized Controlled Trial

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BY

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Abstract

This study was done to prospectively investigate the effects of indwelling urinary catheter placement during cesarean delivery. Trying to avoid or minimize the possibility of urinary tract infection and discomfort offering a better quality of life for those patients.

RCT was performed at the maternity wards of the Department of Obstetrics and Gynecology at Shebin Elkom Teaching Hospital from June 2010 to December 2011.

A total of 60 patients, fulfilling the inclusion criteria, were enrolled in this study. They were allocated randomly into one of two groups (1 and 2) . All women were encouraged to void before being taken to operating theatre table. In Group 2 (n=30), women were routinely catheterized.

The catheter was removed approximately 12 hours after surgery whereas, in group 1 (n=30), cesarean section was carried out without urethral catheterization.

Cesarean sections were performed under spinal or general anesthesia. Procedure was instituted in the standard manner via modified Pfannenstiel incision. In all cases, transverse lower uterine segment incision was performed. During and after the operation, 1-2 liters of N/S or Ringer lactate solution was infused. In the recovery room patients were monitored closely.

Key Words:

Cesarean Section, Urinary Catheters, Urinary Tract Infection.

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List of Abbreviations

^{99m}Tc	metastable nuclear isomer of technetium-99
ACOG	American College of Obstetricians and Gynecologists
BC	Before Christ
BCG	Bacillus Calmette-Guérin
bid	Twice per day (bis in die)
CAUTI	Catheter associated urinary tract infections
CBC	Complete blood count
cc	Cubic centimeter
CDMR	Cesarean delivery on maternal request
Cfu	colony-forming unit
CG	Catheterized group
cm	Centimeter
CNF	cytotoxic necrotizing factor
CNS	Central nervous system
CS	Cesarean section
CSE	Combined spinal-epidural
CSF	Cerebro spinal fluid
CT	Computerized topography
CVS	Cardio vascular system
D5	Dextrose 5%
DMSA	Dimercaptosuccinic acid
e.g.	For example
EMB	Eosin-methylene blue
gm	Gram
h	Hour
HSV	Herpes simplex virus
I and O catheterize	Intermittent and on demand catheterize
IBM	compatible computers
IgA	Immunoglobulin A
IM	Intramuscular
IV	Intravenous
IVPB	Intravenous (Piggy-Back)
LR	Lactate ringer
mcg	Micro gram
mg	Mille gram
MIC	minimal inhibitory concentration
min	Minute
mL	Mille liter
mm	Mille miter
MSSU	Midstream sample of urine
NPO	Nothing per mouth

NS	Normal saline
PCEA	Patient-controlled epidural anesthesia
PDS	Poly-glycolic Dermal Suture
PO	Per oral
Prn	When necessary (pro re nata)
q2-3h	Every 2 -3 hours
qd	Once per day (quaque die)
qid	4 times per day (quater in die)
RCOG	Royal College of Obstetricians and Gynaecologists
RCT	Randomized controlled trial
SC	Subcutaneous
SPECT scanning	A Single Photon Emission Computed Tomography
SPSS	Statistical package for the social science software
STD	Sexually transmitted disease
tid	3 times per day (ter in die)
TMP	Trimethoprim
UG	Uncatheterized group
UK	United Kingdome
US	United States
UTIs	Urinary tract infections
VUR	Vesicoureteral reflux
WIP	Working party on infection prevention

INTRODUCTION

Birth by caesarean section has become a commonplace intervention on the modern labor ward. According to some, the caesarean section rate has reached epidemic proportions. Delivery by caesarean section has been part of human culture since ancient times, but despite rare references to operations on living women, the initial purpose was essentially to retrieve the infant from a dead or dying mother as a measure of last resort. It was not until much later that intervention with a good outcome for mother and baby became possible ***(Hayman R, et al. 2004).***

Cesarean delivery rates have risen steadily (Betra´n AP, et al. 2007).In some parts of the world this has surpassed a ratio of 1:3 when compared to vaginal delivery ***(Macdorman MF, et al.2008).***

This has created a major epidemiological health concern affecting the lives of many childbearing women undergoing this major abdominal surgery. Cesarean delivery carries with it all the complications of any major surgery (for example, anesthesia, infection, bleeding) in addition to injury to major organs and vascular structures at the site of incision. These include, but are not limited to, injury to major vessels (for example, uterine artery) and the urinary bladder, especially after prolonged labors where the bladder is displaced caudally, after previous caesarean section where scarring obliterates the vesico_uterine space, or where a vertical extension to the uterine incision has occurred ***(Hayman R, et al. 2004).***

In addition, there are potential health concerns in future pregnancies including risk of placenta previa/ accreta (Silver RM, et al.2006) and risk of unexplained stillbirth in subsequent pregnancy ***(Smith GC, et al.2003).***

Empirical urinary catheterization is commonly performed during cesarean delivery as it is widely believed that its placement can improve exposure of the lower uterine segment at the time of surgery, prevent urinary bladder injury and avoid postoperative urinary retention ***(Cunningham FG, et al.2005).***

The use of indwelling urinary catheters has been implicated as a main cause of urinary tract contamination(Kunin CM, et al.1994) occurring in 1.7 per 1000 of cesarean delivery patients(Rochelle L, et al.2005) and accounting for greater than 80% of nosocomial urinary tract infections (UTIs))and greater postoperative pain***(Sedor J , et al.1999).***

Moreover, there is a direct cost of using indwelling catheters, in addition to the indirect costs posed by a possible increased risk of UTIs. Finally, patient discomfort and early return to daily activities is a factor that is sometimes not considered by the attending physicians when making the decision whether to catheterize.

In this context, given the need to further evaluate the pragmatic use of indwelling catheters in hemodynamically stable women undergoing cesarean, the team decided to perform this prospective, multicenter, randomized controlled trial (RCT***)(AM Nasr, et al.2009).***

AIM OF THE WORK

The aim of this work is to prospectively investigate the effects of indwelling urinary catheter placement during cesarean delivery. Trying to avoid or minimize the possibility of urinary tract infection and discomfort offering a better quality of life for those patients.

HISTORICAL BACKGROUND

The origin of the term cesarean is obscure, and three principal explanations have been suggested. In the first, according to legend, Julius Caesar was born in this manner, with the result that the procedure became known as the Caesarean operation. Several circumstances weaken this explanation. First, the mother of Julius Caesar lived for many years after his birth in 100 BC, and as late as the 17th century, the operation was almost invariably fatal. Second, the operation, whether performed on the living or the dead, is not mentioned by any medical writer before the Middle Ages. Historical details of the origin of the family name Caesar are found in the monograph by Pickrell (1935).

The second explanation is that the name of the operation is derived from a Roman law, supposedly created in the 8th century BC by Numa Pompilius, ordering that the procedure be performed upon women dying in the last few weeks of pregnancy in the hope of saving the child. This lex regia-king's rule or law—later became the lex Caesarea under the emperors, and the operation itself became known as the caesarean operation. The German term Kaiserschnitt-Kaiser cut-reflects this derivation.

The third explanation is that the word caesarean was derived sometime in the middle ages from the Latin verb caedere, to cut. This explanation seems most logical, but exactly when it was first applied to the operation is uncertain. Because section is derived from the Latin verb seco, which also means cut, the term caesarean section seems tautological-thus cesarean delivery is used. In the United States, the ae in the first syllable of caesarean is replaced with the letter e. In the United Kingdom,

Australia, and most commonwealth nations, the ae is retained. ***(F.Gary Cunningham et al., 2010).***

Patient Choice in Cesarean Delivery

As cesarean delivery has become safer and more commonly performed, and women have taken a more active role in their obstetrical care, it has been argued that women should be able to choose to undergo elective cesarean delivery ***(Harer, 2000).***

This has become one of the most important and controversial issues currently facing our specialty. Although the rate is difficult to determine with precision, elective cesarean delivery is on the rise and by one estimate, has increased 50 percent in the past decade ***(Meikle and colleagues, 2005).***

Gossman and associates (2005) estimated that 2.5 percent of all births in the United States in 2003 were defined as cesarean delivery on maternal request (CDMR). Reasons for mothers to request cesarean delivery include avoidance of pelvic floor injury during vaginal birth, reduced risk of fetal injury, avoidance of the uncertainty and pain of labor, and convenience. Importantly, Worley and colleagues (2009) found that approximately one third of the pregnant women who delivered at their institution entered spontaneous labor at term, and 96 percent of these delivered vaginally without adverse neonatal outcomes. Thus, the debate surrounding CDMR includes its medical rationale from both a maternal and fetal-neonatal standpoint, the concept of informed free choice by the woman, and the autonomy of the physicians in offering this choice.

To address this, the National Institute of Health held a State-of-the-Science Conference on Cesarean Delivery on Maternal Request. A panel of experts critically reviewed available literature to form

recommendations based on risks and benefits identified. It is noteworthy that most of the maternal and neonatal outcomes examined had insufficient data to permit such recommendations. Indeed, one of the main conclusions of the conference was that more high-quality research is needed to fully evaluate the issues. This was also the conclusion of the American College of Obstetricians and Gynecologists (2007a).

The panel was able to draw some conclusions from the existing data. Cesarean delivery on maternal request should not be performed prior to 39 weeks' gestation unless there is evidence of fetal lung maturity. It should be avoided in women desiring several children because of the risk of placenta accreta. Finally, it should not be motivated by the unavailability of effective pain management ***(F.Gary Cunningham et al., 2010).***

ETHICS

Cesarean delivery on maternal request has numerous ethical concepts that have been debated. Bewley and Cockburn (2002a, b) argue that the concept of elective cesarean delivery lacks both ethical and medical merit. Others have concluded that currently available evidence does not support routine elective cesarean delivery. However, it does ethically support an obstetrical decision to accede to an informed patient's request for such a delivery ***(Kalish and associates, 2008; Minkoff, 2006; Minkoff and Chervenak, 2003).***

Clearly, and usually only with the benefit of hindsight, it can be said that some women and infants who have undergone difficult vaginal birth may have been better served by cesarean delivery. In most cases, however, clinically robust means of prospectively identifying otherwise uncomplicated pregnancies in which the woman or her fetus-infant would

benefit from elective cesarean delivery are lacking. At this time, we conclude that it is difficult to justify a laissez faire approach to this major operation (***F.Gary Cunningham et al., 2010).***

INCIDENCE

In 2004, the Caesarean rate was about 20% in the United Kingdom, while the Canadian rate was 22.5% in 2001–2002.In Italy the incidence of Caesarean sections is particularly high, although it varies from region to region. In Campania, 60% of 2008 births reportedly occurred via Caesarean sections. In the Rome region, the mean incidence is around 44%, but can reach as high as 85% in some private clinics. In the United States the Caesarean rate has risen 48% since 1996, reaching a level of 31.8% in 2007. A 2008 report found that fully one-third of babies born in Massachusetts in 2006 were delivered by Caesarean section. In response, the state's Secretary of Health and Human Services, Dr. Judy Ann Bigby, announced the formation of a panel to investigate the reasons for the increase and the implications for public policy ***(Stephen Smith., 2008).***

In Brazil's public health network, the rate reaches 35%, while in private hospitals the rate approaches 80%.China has been cited as having the highest rates of C-sections in the world at 46% as of 2008. Studies have shown that continuity of care with a known carer may significantly decrease the rate of Caesarean delivery ***(Homer CS et al., 2001).*** but there is also research that appears to show that there is no significant difference in Caesarean rates when comparing midwife continuity care to conventional fragmented care ***(Hodnett ED et al.,2008).***More emergency Caesareans—about 66%—are performed during the day rather than during the night ***(Goldstick O et al.,2003).***