Best Practice & Research Clinical Obstetrics and Gynaecology 27 (2013) 251–267

Contents lists available at SciVerse ScienceDirect

Best Practice & Research Clinical Obstetrics and Gynaecology

journal homepage: www.elsevier.com/locate/bpobgyn

8

Timing of caesarean section according to urgency

Tak Yeung Leung, MD, Professor [a,b,*], Terence T. Lao, MD, Professor [a]

[a] Department of Obstetrics and Gynaecology, The Chinese University of Hong Kong, Hong Kong
[b] Department of Obstetrics and Gynaecology, Prince of Wales Hospital, Shatin, Hong Kong

Keywords:
fetal distress
caesarean section
30 minute rule
uterine hyperstimulation
cord prolapse
uterine rupture
placental abruption
tocolysis
bradycardia-to-delivery interval
decision-to-delivery interval

Fetal distress is an emergency condition requiring rapid caesarean delivery. Hence, it has been recommended that the decision-to-delivery interval should be within 30 mins. Many previous studies have failed to show any improved outcome with short decision-to-delivery interval. The reasons are (1) most of these studies were of small scale and retrospective with limitation in design; (2) the indications for caesarean deliveries recruited in these studies were not specific for life-threatening fetal distress; (3) selection bias as clinicians tended to deliver worse cases more quickly than less severe cases; (4) correlation was analysed between adverse fetal outcome and decision to delivery interval, but ignored the bradycardia-to-delivery interval, which reflected the actual duration of fetal hypoxia. Latest studies indeed have shown that bradycardia-to-delivery interval correlated significantly with arterial pH and base excess in life-threatening fetal conditions. The longer the bradycardia-to-delivery, the poorer the arterial blood gases parameters and neonatal outcomes. This result supports that every obstetric unit should have the capability to accomplish emergency caesarean section in 30 mins of decision for fetal safety. The Royal College of Obstetrics and Gynaecology has standardised the classification of the urgency of caesarean delivery, which helps to identify those life-threatening fetal conditions that will be benefited from rapid delivery. Training in teamwork and communication, availability of anaesthetists, and operation theatre are the main factors to achieve a quick caesarean delivery.

* Corresponding author. Department of Obstetrics and Gynaecology, The Chinese University of Hong Kong, Hong Kong. Tel.: +852 26322806; Fax: +852 26360008.
E-mail address: tyleung@cuhk.edu.hk (T.Y. Leung).

1521-6934/$ – see front matter © 2012 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.bpobgyn.2012.09.005

Introduction

Fetal distress is one of the major indications for caesarean section in modern obstetrics.[1] The duration of in-utero fetal hypoxia is regarded as the crucial factor for the development of permanent fetal hypoxic ischaemic brain damage. Hence, it has been advocated that delivery should be as quick as possible once fetal distress is diagnosed. Many professional organisations have also set guidelines that the delivery of the baby should be accomplished within 30 mins after decision of caesarean section, and made this 30-min rule as an auditing standard.[2,3] Therefore, decision-to-delivery interval (DDI) and decision-to-incision interval (DII) are commonly used terms in audit or research.

Although such a proposal seems sensible, it has remained controversial over the past 2 decades, as strong clinical evidence is lacking to support the notion that a short DDI or DII is associated with improved perinatal outcomes.[4] Furthermore, many obstetrics units have shown that emergency delivery is often not achievable within 30 mins in reality.[5–8] New research, however has provided insight into this issue.[9,10] In addition, to avoid the confusion caused by using different terminology such as 'crash', 'urgent' and 'emergency' caesarean section to describe the same category of caesarean section (Tables 1 and 2), the Royal College of Obstetrics and Gynaecology (RCOG) has recently standardised the terminology and classification of urgency of caesarean sections (Table 3). In this review, the origin of the 30-min rule, as well as the evidence to support or challenge this rule, are reviewed. In addition, the practical issue on how to achieve a quick delivery will also be discussed.

The origins of the 30-minute rule

A few early studies in the last century evaluated the DDI time for emergency caesarean section. In the 1950s, Halsey and Douglas[11] reported that the average DII was 43 mins,[11] whereas Choate and Lund[12] reported in 1968 a median DDI of 12 mins, and recommended that delivery should be achieved within 15 mins.[12] In one-third of their deliveries, the DDI exceeded 15 mins and, in 14%, even more than 30 mins were required. According to Boehm in the fifth edition of *Standards for obstetrics and gynecology*[13] published by the American College of Obstetricians and Gynecologists (ACOG) in 1982, 'An obstetric service that generally cares for high-risk patients should be staffed and equipped to handle emergencies and to be able to begin cesarean delivery within 15 minutes.'[13,14]

After the publication in 1987 of a nation-wide survey of 538 hospitals in the USA, which showed that almost all hospitals had the ability to carry out an emergency cesarean section within 30 mins,[15] the 15-min rule was then changed to a 30-min rule in ACOG's sixth edition of *Standards for obstetric services* published in 1988.[16] This was also adopted jointly by the ACOG and the American Academy of Pediatrics in their second edition of the *Guidelines for perinatal care*[17] in the same year. Subsequently, the RCOG, as well as other professional authorities, also adopted this standard,[3,18] although the German Society of Obstetrics and Gynecology set the DDI at 20 mins.[19,20] In the UK, the 30-min rule became a requirement by the Clinical Negligence Scheme for Trusts in 1999,[21] and the Confidential Enquiry into Stillbirths and Deaths in Infancy recommended that obstetric units should carry out surveys of their DDI.[22]

The scientific rationale to set the limit at 30 mins, however, has not been clearly stated in published research or critically reviewed, and hence Schauberger and Chauhan[23] in their review commented that the 30-min rule 'at best should be seen as a consensus of experts, not directly supported by clinical trials or experimental evidence'. Therefore, in the fifth edition of *Guidelines for perinatal care* published jointly by ACOG and the American Academy of Pediatrics in 2002,[2] the emphasis was on the 'capability' to accomplish delivery in 30 mins, rather than as a 'requirement':

Table 1
Lucas et al.'s classification for urgency of caesarean section.[67]

Grade	Term	Definition
1	Emergency	Immediate threat to life of woman or fetus.
2	Urgent	Maternal or fetal compromise that is not immediately life-threatening.
3	Scheduled	Needing early delivery but no maternal or fetal compromise.
4	Elective	At a time to suit the women and maternity team.