

Does the 10-15% Caesarean Section Rate Threshold endorsed by the World Health Organization in 1985 still apply to Modern Obstetrics in Developed Countries? The “Ideal” Caesarean Section Rate and the Stillbirth and Neonatal Death Perspective

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In 1985 the World Health Organization stated “there is no justification for Caesarean Section Rates in any region to be higher than 10-15%” [1]. The World Health Organization expert group drew its conclusions from a review of the limited data available from European countries that indicated good maternal and perinatal outcomes with the rate of Caesarean Sections of between 10-15%. Since then recent publications from the same organization have continued to re-iterate this statement [2].

The World Health Organization cited that the economic imperative was the most common driver for the rise in Caesarean Section rate in sixty-nine (69) developed countries which had Caesarean rates higher than 15%. On the other hand the World Health Organization recommended that there was underutilization of Caesarean Section in fifty-four (54) underdeveloped countries which had Caesarean Section rates lower than 10% [3,4]. The main determinants of the effectiveness of Caesarean Section were directed towards maternal and infant mortality [5]. The impact of Caesarean Section rates on stillbirth rates, cannot to date be determined because of lack of data at population levels [6].

Over the past 50 years Caesarean Section rate has been increasing [7]. In the 1940s and 1950s, the Caesarean Section rate was 5% and remained unchanged for 10 to 15 years. In the latter half of the 1970s, the rate rose to 15% and remained unchanged till the end of the nineties. From the beginning of the millennium there has been a significant increase in the Caesarean Section rate worldwide, which now exceeds 30% in some countries [7].

Recent publications from the World Health Organization did state that “it is impossible from the studies undertaken to correct for increasing maternal age, obesity and the occurrence of medical conditions during pregnancy” [3]. A paper by Zizza et al. [8], supported the World Health Organization Caesarean Section rate with the proviso that adolescent birth rate was taken into consideration. This latter paper confirmed that the adolescent

birth rate is a significant variable reducing the Caesarean Section rate and suggested that in any formula determining the “ideal” Caesarean Section rate the adolescent birth rate should be taken into account [8].

Adolescent birth rates may throw light on some relevant factors that may affect Caesarean Sections rates. Caesarean Section rates are low in countries with high adolescent birth rates [8]. Adolescent birth rates are low in developed countries, impacted in particular by socio-economic status, efficient national healthcare systems, education, contraception and termination. Conversely the lack of these factors that are commonly encountered in underdeveloped countries leading to elevated adolescent birth rates [9].

Except for termination, the factors cited above are prevalent in the Maltese Islands to the extent that the average maternal age having a live birth has consistently increased and in 2014 reached 31 years reducing the adolescent birth rate. Increasing maternal age has been amply proven to correlate with adverse outcome in pregnancy and during labour [10]. Similar to other developed countries the obesity epidemic [11], has also hit the Maltese population with 25% of the pregnant population having a body mass index of 25-30 kg/m² and 20% reaching body mass indexes of over 30kg/m². Medical disorders increase with increasing body mass index and maternal age [12] to the extent that the Gestation Diabetes rate has reached 16.4% and hypertensive disorders account for 6.7% of the pregnant population. All these factors have impacted obstetric practice in developed countries, increasing the trend to higher Caesarean Section rates [9].

Maternal age, high body mass index and medical disorders complicate the pregnancy outcome and are also related to the occurrence stillbirth. In the assessment of the utility of Caesarean Sections, maternal mortality and neonatal mortality rates are oft quoted without much consideration to the stillbirth rate. From

the data from the World Health Organization itself stillbirth rates indicate a trimodal pattern correlating to Caesarean Section rates. The groups can be divided as to stillbirth rates 1. Stillbirth rates of 2-4/1000 live births, 2. Stillbirth rates of 4.1-12/100 live births and 3. 12.-over 30 stillbirths /1000, the maximum being 46.7/1000 in Pakistan. None of the countries with a stillbirth rate of 2-4 /1000 have a Caesarean Section rate between the World Health Organization recommended 10-15% threshold (WHO 2014) [13].

Both Caesarean Section and induction of labour when indicated reduce the stillbirth rates especially in growth restricted babies which account for 4 fold increase risk for stillbirths [14]. The avoidance of prolonged pregnancy in cases of growth restricted pregnancies salvages babies from stillbirth. Moreover post-dates pregnancies beyond 41+ weeks are at greater risk of stillbirth. The avoidance of postdatism entails the application of induction of labour which in itself increases the employment of both instrumental and abdominal delivery [15]. Postdates babies are more likely to occur in scenarios with poor antenatal care. Poor antenatal care initiates with inadequate dating of pregnancy increasing the risk of erroneous expected date of delivery [16]. Consequently with “wrong dates” inappropriate growth surveillance may occur increasing the risk of unrecognized intra-uterine growth retardation [17]. Finally in the scenario of inadequate antenatal care spontaneous onset of labour is more likely to be initiation of the delivery process rather than formal induction of labour.

This editorial does not intend to give a carte blanche to the universal application of Caesarean Section. Besides the obvious increased maternal mortality and morbidity there is also an increase in neonatal mortality and morbidity following elective Caesarean Section [18]. In a large study of 97,095 women (91% coverage) by Villar et al., [19] a review of maternal and neonatal outcomes were carried out under the auspices of the

World Health Organization population survey in 2005. Women undergoing abdominal delivery had an increased risk of severe maternal morbidity compared with women undergoing vaginal delivery. This was significant for both elective and emergency Caesarean Sections, giving odd ratios of 2.0 (95% confidence interval 1.6 to 2.5) for intrapartum caesarean and 2.3 (95% confidence interval 1.7 to 3.1) for elective caesarean). In cases of cephalic presentation, there was a non-significant trend towards a reduced odds ratio for fetal death with elective caesarean, after adjustment for possible confounding variables and gestational age (or 0.7 (95% confidence interval 0.4 to 1.0)). In contrast in cases of breech presentation, caesarean delivery had a large protective effect against fetal death.

Offsetting the non-significant trend towards a reduced risk for intrapartum fetal death with cephalic presentation, the neonatal death rate was significantly increased after elective Caesarean Section [19]. Independent of possible confounding variables and gestational age, intrapartum and elective Caesarean Section significantly increased the risk for neonatal mortality up to hospital discharge. Neonatal mortality following intrapartum and elective Caesarean Section resulted in an odds ratios of 1.9 (95% confidence interval 1.5 to 2.6), which remained elevated even after excluding of all abdominal deliveries for fetal distress. Such increased risk of neonatal death was not seen following Caesarean Section for breech presentation. The avoidance of labour was a risk factor for neonatal mortality up to hospital discharge for babies delivered by elective caesarean delivery.

The above mentioned variables, including the impact on stillbirth and neonatal death rates, should be taken in consideration when determining “ideal” Caesarean Section Rates. These factors should be holistically reflected upon when deciding on “ideal” Caesarean Section rates, especially in the context of changing maternal socio-demography and health characteristics in developed countries.

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