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## Dangers of smoking cigarettes and drinking alcohol during pregnancy

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The first 1 000 days of a child's life, defined as the period from the beginning of pregnancy until the child's second birthday, is the ideal period to lay the foundation for good health and normal development.<sup>[1]</sup> In South Africa (SA), the departments of Health, Social Development and Basic Education, in collaboration with the United Nations Children's Fund (UNICEF), have made the first 1 000 days the major focus in order to reduce infant mortality and improve health of all infants. As part of this focus, it is important to educate every pregnant woman to take responsibility for the good health of her developing fetus and as mother of her child. Much can be done to improve lifestyle before, during and after pregnancy to ensure the improved health of the offspring. The Eunice Kennedy Shriver National Institute of Child Health and Human Development has 12 recommendations for better health during pregnancy, and among them is the well-known advice not to use tobacco, alcohol or drugs during pregnancy.<sup>[2]</sup>

Spontaneous preterm labour, placental abruption and intrauterine growth restriction (IUGR) are associated with smoking during pregnancy. Maternal smoking creates a 1.27 times increased risk for the delivery of a preterm infant.<sup>[3–5]</sup> The common causes of perinatally related losses at Tygerberg Hospital in Western Cape Province, SA, are spontaneous preterm labour, antepartum haemorrhage (particularly placental abruption), and IUGR.<sup>[6]</sup> Smoking causes increased levels of carbon monoxide to cross the placenta, resulting in displacement of oxygen from haemoglobin and reduced release of oxygen to tissues.<sup>[7]</sup> Nicotine decreases blood flow through the uterus, resulting in microscopic vasculature changes in smokers.

Exposure to household tobacco smoke in sub-Saharan Africa is also significantly associated with an increased risk of under-5 mortality.<sup>[8]</sup> In particular, antenatal exposure to maternal

smoking is significantly associated with lower respiratory tract infections and wheezing,<sup>[9]</sup> with a potential increased risk of lifelong poor lung function.<sup>[10]</sup>

In most high-income countries, cigarette consumption has decreased over the past 30 years, but not in China and Indonesia. The prevalence rate of cigarette smoking has also not declined in SA. Steyn *et al.*<sup>[11]</sup> reported a prevalence rate of 47% in 1997, while the Safe Passage Study (SPS),<sup>[12]</sup> in 2014, found that 58.3% of women in the same community smoked cigarettes,<sup>[13]</sup> despite legislation requiring printed health warnings on tobacco products (the Tobacco Products Control Act No. 83 of 1993).<sup>[14]</sup>

Heavy alcohol consumption also increases the risk of low birthweight, preterm birth and placental abruption.<sup>[15,16]</sup> Although a decrease in alcohol consumption has been reported in the Americas and Europe during the past decade, a sharp increase is projected for most other regions, such as the southeast Asian and western Pacific regions. In Africa, an increase in current drinkers and heavy episodic drinkers is projected.<sup>[17]</sup> In the Western Cape the prevalence rate of fetal alcohol syndrome (FAS) seems to be rising, as it increased from 40.5 – 46.5 per 1 000 in 2000 to 65.2 – 74.2 per 1 000 and 68.0 – 89.2 per 1 000 in 2005 and 2007, respectively.<sup>[18–20]</sup>

According to information from the SPS, 46.2% of pregnant women consumed alcohol during pregnancy,<sup>[13]</sup> while hazardous alcohol use was reported in 13% of mothers in the Drakenstein Child Health Study in the Western Cape.<sup>[21]</sup> Hazardous alcohol use was significantly associated with lower infant weight-for-age and head-circumference-for-age *z*-scores, with the potential of detrimental neurodevelopment. Furthermore, hazardous alcohol use was significantly associated with hazardous tobacco use and intimate partner violence.<sup>[21]</sup>

Alcohol use and smoking of cigarettes during pregnancy are associated with an increase in intrauterine deaths.<sup>[22,23]</sup> The SPS reported 145 stillbirths among the outcomes of 11 892 pregnancies. Compared with a non-smoking and non-drinking reference group and after statistical adjustment for the abbreviated propensity scores and other variables that could have an effect on stillbirths, the relative risk for late stillbirth (at 28 weeks' gestation or later) was 1.60 (98.3% confidence interval (CI) 0.64 – 3.98; *p*=0.2221) for smoking only and 2.22 (98.3% CI 0.78 – 6.18; *p*=0.0632) for drinking only, and increased to 2.78 (98.3% CI 1.12 – 6.67) for dual exposure.<sup>[24]</sup>

Sudden infant death syndrome (SIDS) is associated with cigarette smoking<sup>[25]</sup> and alcohol use during pregnancy.<sup>[26]</sup> For this recent SIDS study,<sup>[26]</sup> the 1-year outcome was ascertained in 94.2% of 11 892 enrolled pregnancies and examined for association of pregnancy exposure to smoking and drinking in 28 infants who died of SIDS and 37 with a known cause of death. After statistical adjustment for the propensity scores and variables that could affect the SIDS rate, the relative risk for SIDS was 3.95 (95% CI 0.65 – 24.03) for pregnancies exposed to drinking only and 4.86 (95% CI 1.30 – 18.13; *p*=0.0188) for pregnancies exposed to smoking only when compared with those that were unexposed or where women quit early. However, the adjusted relative risk was 11.78 (95% CI 3.41 – 40.80; *p*=0.0001) for dually exposed pregnancies.<sup>[26]</sup>

Mean gestational age at delivery for women who did not smoke or drink during pregnancy was 274 days, in contrast to 267 days for heavy smokers and drinkers ( $p < 0.01$ ). The mean birthweight of newborns whose mothers did not smoke or drink during pregnancy was 3 132 g, in sharp contrast to 2 709 g for those whose mothers drank or smoked heavily ( $p < 0.01$ ). *Z*-scores of birthweight were also significantly lower in newborns of women who smoked and drank heavily during pregnancy ( $p < 0.01$ ) (unpublished data, HJO).

It is clear that the burden of using these toxic substances is enormous, especially when they are used simultaneously. It is also obvious that current prevention methods such as the prohibition of cigarette advertisements or warning labels on tobacco products and alcoholic drinks are insufficient to reduce their use during pregnancy. It has been shown that guidelines for smoking cessation and counselling in disadvantaged pregnant women could reduce smoking during pregnancy by almost 12%.<sup>[27]</sup> The introduction of such programmes at antenatal clinics is strongly advocated and should form part of the national health agenda for the First 1 000 Days Campaign. The focus should be on strategies to decrease smoking and use of alcohol, especially through public awareness programmes and antenatal education.

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