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Prevention of adverse pulmonary, neurological and ocular perinatal outcomes by supplementing omega-3 fatty acids during pregnancy

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To the Editor:

We read with great interest the recent study published by Kuper et *al.* [1], where the authors randomized pregnant smokers and non-smokers women to receive intramuscularly either 17 alpha-hydroxyprogesterone caproate, an omega-3 fatty acid, or placebo from the 16-20th week of gestation till the delivery, evaluating its effect on the preterm delivery rate and both maternal and neonatal complications.

The authors should be congratulated for the randomized study design and the presence of ethnic variability in the examined population, and, nonetheless, to have found a significant reduction of the spontaneous preterm delivery rate and low birth weight thanks to the anti-oxidative agent supplementation in smoker mothers in comparison to non-smokers [1].

However, we would like to point out some methodological concerns on the prevention of the secondary outcomes examined in the study, in particular dealing with neonatal complications. The authors did not report a significant treatment effect in reducing neonatal complications both in the groups of smokers and not smokers [1]. Concerning this finding, we believe that the smokers population receiving antioxidant supplementation is relatively small (64/851) and, therefore, the statistical power of the study could have been limited by the small sample size. In contrast with the findings in this study, in the literature it is well known the positive association between the oxidative damage due to maternal smoke and the increased incidence of neonatal complications such as bronchopulmonary dysplasia (BPD), intraventricular hemorrhage, and retinopathy of prematurity [2]. On this regard, several clinical studies showed that the maternal supplementation of vitamin A, which exerts antioxidant activity, during the late phase of pregnancy, is effective in decreasing BPD incidence in newborns [3]. Moreover, in line with this findings, Sharma et *al*. found in the rat model that the maternal supplementation with polyunsaturated fatty acids ω-3 (PUFA ω-3) decreases significantly the neonatal onset of BPD, especially protecting the reduction of alveolarization caused by the hyperoxia-induced oxidative damage [4].

Given these assumptions, we deem that omega-3 fatty acid supplementation should be more thoroughly investigated for preventing the onset of neonatal complications for at least two reasons: firstly, their efficacy in reducing significantly the preterm delivery rate in smoker mothers and secondly through the already proven protective effect during pregnancy. Thus, further larger scale studies should be performed in order to better understand the potential effect of antioxidant agents administration in pregnancy of smoker women.

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