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Paracetamol Poisoning in Pregnancy: An Urgent Call for Action (Letter to Editor)

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Dear Editor,

We found that paracetamol (acetaminophen) is a common anti-pyretic and analgesic drug. In the United States of America, it is reported to be consumed by more than 65% females during pregnancy; this percentage is also over 50% in Europe, and it's approximately 61.5% in Northern Europe[1]. As the most widely accessible drug, it is considered to be one of the safest drugs taken by pregnant women during their gestational period for minor symptomatic illness, for instance, headache, pain, cold or flu, and sleeping difficulties. However, the prolonged utilization of paracetamol (> 3-4 grams) leads to adverse effects in both mother and fetus.

Paracetamol is a lipophilic drug, therefore, it easily crosses the placenta, producing a toxic metabolite called NAPQI (N-acetyl-p-benzoquinone imine) and due to overdose, this metabolite is produced excessively, resulting in binding of NAPQI with fetal cellular proteins and maternal hepatic enzymes, ultimately leading to oxidative stress in the fetus and liver toxicity in the mother.

Additionally, paracetamol may also act as an endocrine disruptor because it inhibits the level of testosterone, causing cryptorchidism and other reproductive abnormalities in the fetus[2]. A meta-analysis reported that the excessive use of paracetamol during pregnancy is associated with increased reactive oxygen species (ROS) and immune dysregulation (Th2 cells dominance) that leads to an increased risk of asthma and wheezing in children[3]. Recent studies also reported that paracetamol disrupts the endocannabinoid system (ECS) in the brain, causing disturbances in excitatory and inhibitory neuronal circuits, which triggers the risk of attention deficit/hyperactivity disorder (ADHD), autism spectrum disorder (ASD), and behavioral problems in children[4]. The findings can be attributed to the fact that paracetamol overdosing causes oxidative stress, dysregulation of immune responses, and developmental retardation in infants.

Pharmacological action of paracetamol is implemented through the inhibition of enzyme known as cyclooxygenase (COX). It, therefore, reduces the production of the prostaglandins. The decline in the levels of prostaglandins in pregnancy however leads to impaired placental perfusion, vasoconstriction and elevated blood pressure which are clinical attributes of preeclampsia. The further presence of these symptoms can contribute to the aggravation of endothelial damage, oxidative stress, and a dysfunctional blood flow to the placenta, subsequently leading to eclampsia, which is characterized by seizures and dysfunction in multiple organs in the mother [5].

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Though paracetamol is one of the regularly used medications during pregnancy, it is necessary to inform women about the safe dosage, possible side effects of excessive consumption, and prescribing without the recommendation by healthcare facilities about the careless use of this medicine via health campaigns, community awareness campaigns through television, and social networks. More to the point, the matter of excessive consumption of paracetamol by pregnant female patients that do not have any valid reason should be discouraged by gynecologist and other health professionals that work with women, who are pregnant at the time. These procedures will protect the mother and the fetus against the fatal and toxic effects of the paracetamol. So it will be saving two lives at the preventive measure of the mother.

Author's contributions:

Noor Fatima, a medical student, conceived the idea and formulated key points. Huda Faisal, also a medical student, refined the data and drafted the first version of the manuscript. Dr. Sohaib Mukhtar Tarar reviewed and drafted the final version of the manuscript, provided proofreading, and final approval.

Competing interests:

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

IRB Approval: This study has no original data, that's why IRB approval is not applicable.

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