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| **Name:** |
| Madison Dolen |
| **Group:** |
| 5B-1 |
| **Pathology Question:** |
| What is/are the causes of maternal and fetal metheglobinemia due to the administration of local anesthetic during pregnancy? |
| **Report:** |
| Methemoglobinemia is a condition characterized by the inability of hemoglobin (in red blood cells) to carry oxygen to the tissues. This is due to ferrous iron (Fe2+) being oxidized to ferric iron (Fe3+), which is unable to bind oxygen and therefore results in hypoxia. Methemoglobinemia can be congenital or acquired. When it’s congenital there are three main types. Type I is the most common and cyanosis is usually the only main symptom along with shortness of breath and weakness, all which can be maintained. Type II is due to a cytochrome b5 reductase deficiency, which is an enzyme that coverts methemoglobin to hemoglobin. This condition is much more severe and can be fatal or result in neurological problems. The last congenital type is with Hemoglobin M disease. Methemoglobinemia can be acquired by being exposed to oxidizing substances or drugs. Additionally, fetal hemoglobin oxidizes to methemoglobin rather easily which is why fetal methemoglobinemia is often a concern.  When it comes to prevention prilocaine, benzocaine, lidocaine, and dapsone should all try to be avoided during pregnancy, these substances oxidize hemoglobin to methemoglobin and put the individual at a higher risk. Additionally, avoid nitrates in food or water and avoid certain medications and oxidant substances (such as antimalarial drugs).  In the case of acquiring methemoglobinemia one could be treated with methylene blue or ascorbic acid. In pregnant patients methylene blue requires a risk/benefit analysis due to it being classified as a teratogen. In circumstances where pregnant women need an alternative to methylene blue, they should be treated with ascorbic acid (vitamin C) with transfusion of packed red blood cells. |
| **References:** |
| Faust, Andrew C., et al. “Local Anesthetic−Induced Methemoglobinemia During Pregnancy: A Case Report and Evaluation of Treatment Options.” *The Journal of Emergency Medicine*, Elsevier, 5 Mar. 2018.  “Autosomal Recessive Congenital Methemoglobinemia - Genetics Home Reference - NIH.” *U.S. National Library of Medicine*, National Institutes of Health, ghr.nlm.nih.gov/condition/autosomal-recessive-congenital-methemoglobinemia. |