CDC Reports Prilocaine-Induced Methemoglobinemia

Methemoglobinemia is an uncommon disorder in which hemoglobin is not oxidized and not capable of binding oxygen. This condition may be associated with exposure to nitrate-contaminated drinking water, aniline dyes, and amide-containing medications. Orthotoluidine, a metabolite of the local anesthetic prilocaine, also can induce this condition.

According to *Morbidity and Mortality Weekly Report*, published by the Centers for Disease Control and Prevention, three Wisconsin women treated by the same oral surgeon developed methemoglobinemia after being injected with a prilocaine-based local anesthetic. The surgeon notified the Division of Health, Wisconsin Department of Health and Social Services, of these cases one week after the third case occurred. In each of the three cases, the surgeon removed four wisdom teeth, and administered prilocaine anesthetic by local injection. The women were aged 22, 33 and 17, and within a few hours or less of having the injection, symptoms developed that included dizziness, perioral and nailbed cyanosis, fatigue, orthostatic hypotension with syncope, tachycardia, and shakiness. The women were treated at an emergency department with oxygen and intravenous methylene blue, and all recovered fully.

The CDC notes that prilocaine is a lidocaine homologue and the only secondary amine local anesthetic that remains in clinical use. Prilocaine is biotransformed by hepatic amidase to aminophenol metabolites, which subsequently can oxidize hemoglobin to methemoglobin. Administration of prilocaine in doses exceeding 400 mg has been associated with methemoglobinemia in adults. Proportionately lower doses may cause this problem in children. Methemoglobin levels above 10 percent may result in clinical anoxia, and levels above 60 percent can cause stupor, coma and death. In the three Wisconsin cases, the methemoglobin levels were found to be 27 percent, 28 percent, and 10.7 percent after injection with prilocaine. In two cases, the women received 560 mg of prilocaine, and in the third case, the woman received 480 mg of prilocaine.

The CDC cautions health practitioners to use accurate body weight information to calculate safe doses of prilocaine, and to know that doses exceeding 4.0 mg per pound of body weight pose a risk to healthy adults. The risk for adverse effects associated with prilocaine use is increased for infants, persons with underlying health problems such as anemia or diseases affecting the respiratory or cardiovascular systems, persons with hereditary deficiencies of glucose-6-phosphate dehydrogenase and methemoglobin reductase, and persons taking other oxidant drugs, e.g. nitrite-containing medications, sulfonamides, antimalarials, or acetaminophen.■