



COVER STORY

Pregnancy outcome after in utero exposure to local anesthetics as part of dental treatment

A prospective comparative cohort study

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Oral health is related closely to general health and to quality of life,¹ and this position is supported by the World Health Organization.² General health is important throughout life and particularly during pregnancy. Pregnancy is characterized by physiological and psychological changes, some of which can affect oral health adversely.^{3,4} Hence, there is a need to maintain oral hygiene carefully during pregnancy.⁵ The mother's oral health during pregnancy is related closely to the oral health of her newborn.⁶⁻¹² Bad oral hygiene in pregnancy has been associated with various adverse effects, such as premature delivery, intrauterine growth restriction, gestational diabetes, and pre-eclampsia.¹³⁻²⁴ Professional authorities in the United States,

such as the American Congress of Obstetricians and Gynecologists and the American Academy of Pediatrics, strongly advise pregnant women to continue their usual dental care during pregnancy.^{25,26} The American College of Obstetricians and Gynecologists published a

ABSTRACT

Background. Dental treatment and use of local anesthetics during pregnancy generally are considered harmless because of lack of evidence of adverse pregnancy effects. Data on the safety of dental treatment and local anesthetics during pregnancy are scant. Dental care is often a reason for concern both among women and their health care providers. The primary objective of this study was to evaluate the rate of major anomalies after exposure to local anesthetics as part of dental care during pregnancy.

Methods. The authors performed a prospective, comparative observational study at the Israeli Teratology Information Services between 1999 and 2005.

Results. The authors followed 210 pregnancies exposed to dental local anesthetics (112 [53%] in the first trimester) and compared them with 794 pregnancies not exposed to teratogens. The rate of major anomalies was not significantly different between the groups (4.8% versus 3.3%, $P = .300$). There was no difference in the rate of miscarriages, gestational age at delivery, or birth weight. The most common types of dental treatment were endodontic treatment (43%), tooth extraction (31%), and tooth restoration (21%). Most women (63%) were not exposed to additional medications. Approximately one-half (51%) of the women were not exposed to dental radiography, and 44% were exposed to radiation, mostly bite-wing radiography.

Conclusions. This study's results suggest that use of dental local anesthetics, as well as dental treatment during pregnancy, do not represent a major teratogenic risk.

Practical Implications. There seems to be no reason to prevent pregnant women from receiving dental treatment and local anesthetics during pregnancy.

Key Words. Dental care; pregnancy; local anesthetics; major congenital anomalies.

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committee opinion stating that treatment of oral conditions is safe during pregnancy and may be managed at any time during pregnancy, especially conditions that require immediate treatment.²⁷ Various dental therapeutic aspects raise concern among pregnant women, such as the use of local anesthetics and radiography. Results from animal reproductive studies on lidocaine in rats did not show any increase in birth anomalies.^{28,29} Lidocaine and other local anesthetics readily cross human placenta,³⁰ and minutes after administration, they reach the fetus, which has the ability to metabolize them.³¹

A 2% lidocaine dental injection has its anesthetic effect for 1 hour inside the tooth pulp, or 3 to 5 hours in the surrounding tissues, when a vasoconstrictor is used.³² Lidocaine, prilocaine, and etidocaine are assigned to US Food and Drug Administration pregnancy Category B. Mepivacaine, bupivacaine, and articaine are assigned to US Food and Drug Administration Category C.³³ Epinephrine is a catecholamine, which normally is present in the body, with no clear evidence of an increased risk of malformation when used during pregnancy with local anesthetics.³⁴ Human pregnancy data on the safety of local anesthetics are scant and include 293 women who were exposed to lidocaine during the first trimester, with no significant increase in the rate of birth anomalies.³⁴ Concerning x-ray exposure, the US National Council on Radiation Protection & Measurements declared that the risk for birth anomalies after maternal exposure to up to 50 millisieverts or less is negligible.^{35,36} Dental radiographs have a low effective dose compared with that of other types of diagnostic radiation and range from 0.005 mSv for intraoral radiography to 0.2 mSv for dental computed tomography.³⁷ Despite the reassuring considerations, dentists are still reluctant to perform dental treatment in pregnant patients, and women are still reluctant to receive dental treatment during pregnancy.

The primary objective of our study was to evaluate the rate of major congenital anomalies after exposure to local

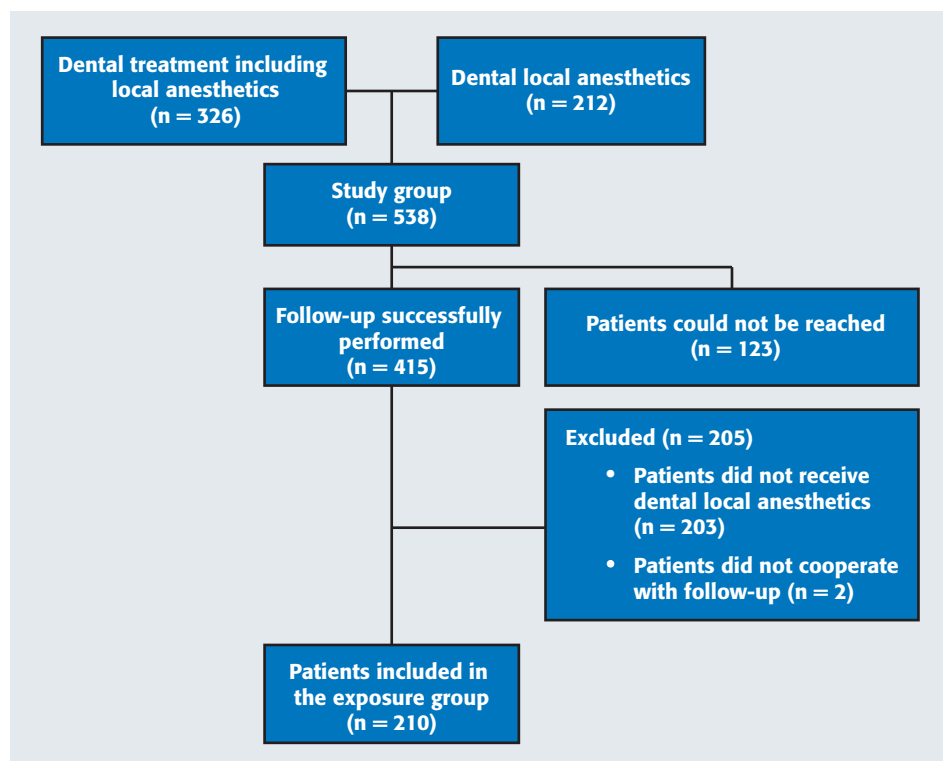


Figure 1. Flowchart of patients included in the exposure group.

anesthetics as part of necessary dental care during the first trimester of pregnancy compared with that in a group of women counseled for nonteratogenic exposures. A secondary objective was to compare the rate of miscarriages, preterm deliveries, and birth weight between the 2 groups. Another secondary objective was to describe what types of dental treatments pregnant women had received during pregnancy. To our knowledge, this is the first prospective comparative study for evaluation of this medical issue.

METHODS

Between 1999 and 2005, 538 pregnant women contacted the Israeli Teratology Information Service (TIS), either directly or through their health care providers, for information about gestational exposure to dental anesthetics. **Figure 1** shows the number of pregnant women who sought information about dental local anesthetics (n = 212) or dental treatment including local anesthetics (n = 326) who were enrolled in this prospective comparative observational study. We were able to contact by phone 415 women, and we excluded those who

ABBREVIATION KEY. CG: Control group. EG: Exposure group. NA: Not applicable. TIS: Teratology Information Service.

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