Socioeconomic factors affect cleft lip and cleft palate risks

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Certain factors reflecting lower socioeconomic status (SES) are linked to increased risks of cleft lip and/or cleft palate, reports a study in the January issue of *Plastic and Reconstructive Surgery*, the official medical journal of the American Society of Plastic Surgeons (ASPS).

Different socioeconomic indicators are associated with different types of orofacial clefts—cleft lip with/without cleft palate (CLP) versus cleft palate only (CPO), according to the new research by Jordan W. Swanson, MD, MSc, Giap H. Vu, MD, and colleagues at the Children's Hospital of Philadelphia. "Previous research shows that children born into families with fewer resources often have delayed care and poorer outcomes from treatment," explains Dr. Swanson. "Here we looked at whether factors of poverty are associated with risk of having a cleft lip or palate in the first place."

Plastic and reconstructive surgeons are key members of the team of specialists providing care for children with cleft lip and cleft palate —one of the most common congenital anomalies.

Differing effects of SES on 'environmentally versus genetically determined' clefts

Dr. Swanson, Dr. Vu, and colleagues analyzed data from a US nationwide birth database, including approximately 6.25 million births in 2016 and 2017. Of these, 2,984 births (0.05 percent) were affected by

CLP and 1,180 by CPO (0.02 percent).

The study examined a number of proxies for SES, including mother's level of education, use of the federal WIC program (Special Supplemental Nutrition Program for Women, Infants, and Children), and insurance status (Medicaid versus private insurance). These potential socioeconomic risk factors for CLP or CPO were analyzed with adjustment for other variables, including demographic factors, prenatal care, maternal health, and infant characteristics.

Some of the socioeconomic indicators were significantly associated with the risk of cleft lip/cleft palate. Maternal education was a protective factor, with a 27 percent lower risk of CLP for infants born to mothers who had a college degree or higher. In contrast, receiving WIC assistance was associated with a 25 percent increase in the risk of CPO. In adjusted analyses, Medicaid coverage was unrelated to the risk of CLP or CPO.

"Notably, early prenatal care was protective against the development of CLP," the researchers write. Delayed prenatal care was a risk factor for CLP: risk was increased by 14 percent for women who started prenatal care in the second trimester of pregnancy and 23 percent in the third trimester, compared to women who started prenatal care in the first trimester. In contrast, the timing of prenatal care was unrelated to the risk of CPO.

The study confirmed some previously known risk factors for orofacial clefts. Male sex, first-trimester smoking, and maternal gestational diabetes were all associated with an increased risk of CLP. Smoking and maternal infections before pregnancy were associated with an increased risk of CPO, while female sex was a protective factor against CPO.

As in previous studies, most risk factors for CPO did not overlap with

those for CLP—supporting the theory that these two categories of clefts have different causative factors. Dr. Swanson, Dr. Vu, and colleagues write: "[T]he association between SES and orofacial clefts appears to differ by phenotype, with CLP being linked more strongly to environmentally-mediated ('nurture') factors, including socioeconomic factors, and CPO being more genetically-driven ('nature')."

The researchers speculate on some ways that socioeconomic factors might affect the risks of orofacial clefts. For example, mothers with higher education levels might be better informed about, and have better access to, prenatal care and adequate nutrition during pregnancy. The nutritional support provided to women enrolled in WIC might avoid the risk of "environmentally-determined" CLP, but not "genetically-determined" CPO.

Dr. Swanson, Dr. Vu, and colleagues hope their findings will help to clarify the previous mixed results on the relationship between SES and orofacial clefts. They call for further studies "to elucidate the mechanisms underlying the relationship between SES and risks of CLP and CPO in order to improve and implement public health policies aimed at reducing the burden of clefts and its disproportionate impact on socioeconomically disadvantaged populations."

Dr. Vu adds: "Such understandings and partnerships among researchers, health professionals, policymakers, social agencies, and local communities will allow us, as a society, to inch towards greater health parity."

More information: Giap H. Vu et al, Poverty and Risk of Cleft Lip and Palate: An Analysis of United States Birth Data, *Plastic & Reconstructive Surgery* (2021). DOI: 10.1097/PRS.0000000000008636