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Association between birth-related factors and tension-type headache in adulthood: a prospective birth cohort study

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Introduction
Tension-type headache (TTH) is a highly prevalent primary headache disorder. While perinatal factors are recognized predictors for various adult neurological conditions, their specific influence on the longitudinal trajectory of TTH requires further investigation.

Objective
To describe the prevalence of TTH and investigate its association with early-life birth-related variables in a prospective longitudinal birth cohort.

Methods
This population-based study evaluated 2,468 participants followed from birth to adulthood. TTH diagnosis was established according to the International Classification of Headache Disorders, 3rd edition (ICHD-3) criteria. Evaluated independent birth-related variables included maternal and paternal age, number of prenatal visits, maternal smoking during pregnancy, prematurity, birthweight classification, Kramer index, mode of birth, and sex. Associations were analyzed using a multivariable binary logistic regression with a backward stepwise approach (likelihood ratio method).

Results
The prevalence of TTH in adulthood was 14.1% (n=349). The TTH group had a mean age of 31.4 (SD=7.7) years and comprised 40.1% females. In the final multivariable regression model, female sex was the only variable significantly associated with the outcome, presenting a lower likelihood of TTH diagnosis compared to males (OR=0.509; 95% CI: 0.397–0.653; p<0.001). Maternal smoking during pregnancy showed a non-significant inverse trend (OR=0.746; 95% CI: 0.554–1.005; p=0.054). Notably, the overall model demonstrated low explanatory power (Nagelkerke R^2=0.027) and a sensitivity of 0.0%, reflecting a limited capacity to accurately predict TTH cases based on the assessed early-life variables.

Conclusion
Early-life and birth-related factors evaluated in this cohort demonstrated limited association with the occurrence of TTH in adulthood. Although female sex was inversely associated with TTH diagnosis, the very low predictive capacity of the perinatal model indicates that these intrauterine conditions do not substantially contribute to the pathogenesis of tension-type headache later in life.

Keywords:
Tension-type headache
Prenatal exposure delayed effects
Cohort studies

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