

# Sex ratio of infants born to women with severe chronic constipation

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Czeizel et al<sup>1</sup> reported a significant male excess among infants born to women with severe chronic constipation as contrasted with controls. Czeizel and colleagues were unable to account for this phenomenon, so I wish to suggest an explanation. Women (as contrasted with men) are disproportionately often affected by constipation, which is frequently aggravated by pregnancy and ameliorated after delivery,<sup>2</sup> so it is reasonable to wonder whether constipation has hormonal causes. Large quantities of data have been adduced to support the hypothesis that the sex ratios (proportions male) of mammalian (including human) offspring are partially controlled by the hormone levels of both parents around the time of conception.<sup>3–5</sup> The probability of a male birth varies positively with some function of the form:

$$(E + T)/(G + P)$$

where E, T, G, and P are sex-standardized concentrations of parental estrogen, testosterone, gonadotrophins, and progesterone around the time of conception.

Kamm et al<sup>6</sup> reported that women with severe constipation have a 'consistent reduction of steroid hormones'. However, Maruti et al<sup>7</sup> suggested that women with low bowel motility (as contrasted with those with high bowel motility) had high serum estrogen levels, and a higher risk for breast cancer. And Vesna and Neli<sup>8</sup> reported that vaginal estrogen replacement therapy was associated with constipation. Accordingly I suggest that women with severe constipation may have high estrogen concentrations and, for this reason, have a statistical excess of sons.

## Disclosure

The author reports no conflicts of interest in this work.

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## Sex ratio of infants born to women with severe chronic constipation: authors' response

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We thank Dr James for his comments to help us better understand an unexpected finding of our previous study. The objective of our 10-year project was a systematic analysis of all maternal diseases during the study pregnancy that may effect the fetal development, particularly for the risk

of congenital abnormalities and preterm birth, the two most important components of infant mortality and handicaps in the large population-based Hungarian Case-Control Surveillance of Congenital Abnormalities.<sup>1</sup> This research series resulted in some unexpected findings, one of which was the excess of male infants born to pregnant women with severe chronic constipation. In fact, we – medical geneticist (AEC), mathematician (HEP), and obstetrician (FB) – were not able to find an appropriate explanation for this unexpected new finding. Our hope was that after the publication of the short report of these data, experts in this field would provide a more reasonable hypothesis for this phenomenon. We are happy that our hopes were realized with Dr James' letter.

## Disclosure

The authors report no conflicts of interest in this work.

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