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Can total cell-free DNA in maternal plasma or serum be used to predict preeclampsia? A systematic review

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Objective

Our aim was to evaluate total cell-free DNA (cfDNA) as a predictor of preeclampsia (PE).

Methods

A systematic review was conducted by searching Pubmed and Medline using the keywords: total cell free DNA, cell free fetal DNA, maternal cell free DNA, preeclampsia, and adverse pregnancy outcome. Literature reporting levels of total cfDNA in development of PE were included. Studies that only reported fetal cell-free cffDNA but no cfDNA concentrations were not included in this review.

Results

206 articles were collected from Pubmed and Medline through literature review. 108 were selected after 98 duplicates removed. Two investigators independently reviewed the abstracts. Based on the selection criteria, 100 articles were excluded. 8 studies were included in this review. Seven reported the values of total cfDNA in PE patients, regardless of early or late onset PE, six of which demonstrated a significant increase of maternal cfDNA levels in patients with subsequently developed PE. Seven studies evaluated total cfDNA levels in the first trimester, six of which showed a significant increase of total cfDNA concentrations in women with later developed PE compared to controls. Five studies investigated total cfDNA levels in the second trimester, all presenting increased total cfDNA levels in the PE group compared to normal controls.

Conclusion

Based on this systematic review, total cfDNA might be a more reliable and promising biochemical marker for prediction of PE, compared with cffDNA. Large prospective studies with homogeneous populations and standardized methodology are needed to further confirm the predictive potential of total cfDNA.