A Population Based Study on Trends of the Mode of Delivery Subsequent to Stillbirth, Infant Mortality and Severe Infant Malformations in the State of Hesse, Germany Between 1990 and 2012

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Background: Women giving birth to a child with severe infant malformations or suffering a stillbirth certainly experience a mental trauma. Therefore the objective of the present study is to examine the incidence of deliveries subsequent to such a traumatic experience as well as the mode of delivery. Secondly, the results are compared to the changes in a non-affected group of deliveries. The present population-based study is to the best of our knowledge the first one reporting on the mode of delivery following such a traumatic event overseeing more than 1.2 million deliveries over the last 23 years in the state of Hesse, Germany.

Patients and Methods: The total obstetric dataset of the Hessian Perinatal Registry (HEPE) was assessed for women with regard to one item of the pregnancy risk factors. This particular HEPE item comprises information on the rates of stillbirth, early and late infant mortality (≤ 7 days, < 1 year) as well as severe infantile malformations in women giving birth subsequent to such an extent traumatic experience. The identified women were categorised with respect to the mode of delivery (spontaneous, vaginal operative or Cesarean section), pre- and full-term birth and according to four time frames between 1990 and 2012. The results of women with a positive HEPE item were compared to those of women without such a traumatic experience (non-affected group) of the HEPE analysed in the same categories and time frames.

Limitations: The heterogeneous information included in the HEPE item represents one of the limitations of the study. As a population-based registry for inpatient deliveries, the HEPE does not include births in non-hospital institutions or deliveries at home. However, in comparison to all deliveries in Germany the proportion of non-hospital deliveries is less than 2 %.

Results and Discussion: The obstetric dataset from 1990 until 2012 of the HEPE comprised altogether 1 224 760 deliveries including a group of 19 726 (1.61 %) deliveries subsequent to a positive result for the analysed HEPE item. Over the duration of follow-up the rate of subsequent pregnancies following such a traumatic experience showed a significant decrease of 43 % in comparison to the immediately previous time frame, respectively (1990–1996: 30.3 %; 2008–2013: 17 %; P ≤ 0.0001). With respect to the mode of delivery (spontaneous, vaginal operative, Cesarean section) the results in the group subsequent to the positive HEPE item (1862, 55.5 %; 70, 2.1 %; 1416, 42.2 %) were significantly different (p < 0.001) in comparison to those of the non-affected group (142 846, 59.9 %; 13 875, 5.8 %; 81 089, 34.0 %), respectively.

With respect to a systematic worldwide analysis, it has been estimated that the global stillbirth rate in 1995 (3.03 million) has declined by 14.5 % compared to 2009 (2.64 million) resulting in 22.1 versus 18.9 stillbirths per 1000 births. These findings are confirmed by the reduction of the positive HEPE item over the observation period. Nevertheless, this excellent achievement is challenged by the significantly rising rate of Cesarean Sections (CS) (Fig. 1).

Conclusion: Rising rates of CSs and conversely decrease of vaginal deliveries in most cases of full-term pregnancies contrast with the reduction of the positive HEPE item over the last 23 years. There seems to be an urgent need for action since this observed critical trend remains highly significant in comparison with the rising trend of CS in general. Pre-pregnancy counselling and continuous monitoring during pregnancy and delivery in the awareness of evident risk factors may provide an opportunity to cope with these serious findings.

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