

## EDITORIAL

# Prevention at the Beginning of Life: Cerebral Hemorrhage in Very Preterm Infants

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Editorial to accompany the article: „Prospective risk factor monitoring reduces intracranial hemorrhage rates in preterm infants“ by Schmid MB, Reister F, Mayer B, Hopfner RJ in this issue of *Deutsches Ärzteblatt International*

The long-term prognosis of very preterm infants, particularly those with a birth weight of less than 1500 grams, is determined essentially by complications during postnatal intensive care. Many large studies have shown that high-grade intracranial hemorrhage in particular, whether with or without parenchymal involvement, limits these children's long-term psychomotor prognosis (1).

This is why discussion of the quality of treatment of preterm infants has focused on other quality indicators, particularly the intracranial hemorrhage rate, in addition to survival rates. Not long ago, this journal published an article on risk-adjusted analysis of the intracranial hemorrhage rate in preterm infants that not only showed how complicated it is to compare specialized facilities in terms of this quality indicator but also made plain the major variation in the incidence of intracranial hemorrhage in preterm infants (2). There are substantial differences in this parameter, in both Germany and other countries (3).

## A deciding factor in long-term prognosis

Because intracranial hemorrhage in preterm infants usually occurs in the first few days after birth, this short, critical phase immediately after birth can play a decisive role in long-term prognosis. Disruption to normal psychomotor development has serious effects for the individual and places a significant burden on the child's family. It is also associated with increased care needs.

Aside from the consequences for individual patients and their families, the additional costs for the health-care system, which are substantial in the long term, should be taken into account (4).

## Improvements to care take second place

Unfortunately, due to the sheer volume and quality of epidemiological data, the notion of improving the treatment of infants on the basis of scientific evidence takes second place behind other issues in discussions to evaluate different treatment outcomes. Returning to the scientific data shows that many individual factors that increase the risk of intracranial hemorrhage in very preterm infants are already known. In addition to risk factors that neonatologists cannot change—such as

gestational age, completion of antenatal steroid prophylactic treatment, and amniotic infection syndrome—a range of risk factors that can be affected by appropriate postpartum quality management have also been identified.

Just some of the important factors are the following (5):

- Late cutting of the umbilical cord
- Prevention of fluctuations in CNS perfusion if self-regulation is not yet sufficiently developed
- Strict monitoring of vital signs.

## A package of measures to reduce the rate of intracranial hemorrhage

In the German-speaking world too, it has already been shown that the above-mentioned individual factors affecting the intracranial hemorrhage rate in very preterm infants are not the only factors that can result in significantly better treatment outcomes: A package of measures intended to reduce the intracranial hemorrhage rate also contributes to this end (6). The article by Schmid et al. published in the current edition of *Deutsches Ärzteblatt International* goes beyond previously published work and examines such a package of measures. The authors find evidence of a decrease of approximately 50% in the intracranial hemorrhage rate in comparison to a historical patient cohort (7). This is a more than encouraging finding in view of long-term consequences alone; it results from successful collaboration between all members of the treatment team, not from the actions of one individual or a single measure.

The importance of the experience of the team providing treatment should not be underestimated in this regard. There is incontestable scientific evidence that the number and training of staff members on the one hand and the quality of care of preterm infants on the other substantially affect treatment outcomes in this patient cohort (8, 9).

DRG lump sums for preterm infants take this very fact into account and are calculated on the basis of comparatively high staff numbers and high-quality equipment.

Critics of the study will say that not all measures in the package are evidence-based. This is impossible to deny. However, it is very difficult to evaluate each individual parameter in large, and therefore reliable,

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multicenter studies, as resources are limited and there are many important questions to address. This study does show, though, that regularly recalling the important aims of treatment and self-monitoring by the whole treatment team leads to long-lasting improvement in treatment outcomes. This is not in the least surprising if one thinks of how effective regular hand hygiene training and team training are in preventing infection, for example (10).

### A return to scientific evidence

Schmid et al.'s paper is only one of many examples that demonstrate that standard operating procedures (SOPs) lead to improved treatment outcomes. The Ulm team's intervention program indicates that the following factors improve treatment outcomes:

- Evaluation of scientific data
- Interdisciplinary collaboration
- Rigorous implementation of guidelines
- Regular critical reflection of quality and complication indicators.

This reduces treatment costs, an issue that at a time of great economic pressure should not be underrated. In this context it should be repeated that the DRG system too must reward quality, not complications. At the same time, a return to scientific evidence is an attempt to resolve the current heated discussion of the incidence of risk factors and risk-adjusted comparison of these epidemiology figures.

These figures merely enable treating physicians to compare treatment outcomes for different facilities, in addition to different times at a single facility; they cannot in and of themselves lead to improved treatment quality. Priority must be given to improving treatment outcomes, precisely because of the lifelong consequences.

#### Conflict of interest statement

Dr. Ehrhardt is the head senior neonatologist at Justus Liebig University Gießen; Prof. Zimmer is executive director of medicine at the Pediatric Hospital, Justus Liebig University Gießen and head of the Department of General Pediatrics and Neonatology. No conflict of interest exists.

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