

Apgar scores 'within the normal range' linked to higher risks of illness and death

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Apgar scores of 7, 8, and 9 (considered to be within the normal range) are associated with higher risks of illness and even death in newborns, finds a large study from Sweden published by *The BMJ* today.

The odds of problems are increased with "normal" scores less than 10, but the researchers stress that the risk is still low and certainly lower than for babies with scores outside of the normal range.

The Apgar score is a quick and simple way to assess a baby's condition at birth. The baby is assessed at one, five and 10 minutes after birth on five simple criteria (complexion, pulse rate, reaction when stimulated, muscle tone, and breathing) on a scale from zero to two. The five values are then added up to obtain an overall score from zero to 10.

Scores of less than seven are considered low and are known to carry higher risks of infections and breathing problems, as well as long term conditions such as epilepsy and cerebral palsy.

Scores of 7 to 10 are considered to be "within the normal range" and therefore reassuring. But no study has investigated whether normal scores of 7, 8, or 9 are associated with greater risk of illness or death than a perfect score of 10.

So a research team, led by Dr. Neda Razaz at the Karolinska Institutet in Sweden, set out to compare associations between Apgar scores of 7, 8, and 9 (vs 10) with illness and death in newborns.

They analysed data from more than 1.5 million Swedish infants born at full term between 1999 and 2016. Infants with Apgar scores of 7, 8, and 9 at one, five, and 10 minutes after birth were compared with those with an Apgar score of 10 at one, five, and 10 minutes after birth.

After taking account of several factors, such as mother's age, weight (BMI), and smoking during pregnancy, the researchers found that Apgar scores of 7, 8 and 9 at one, five, and 10 minutes after birth were strongly associated with higher risk of infections, [breathing problems](#), [brain injury](#) as a result of oxygen deprivation, low blood sugar levels, and

death compared with an Apgar score of 10.

For example, compared with a one-minute Apgar score of 10, a one-minute Apgar score of 9 was associated with a 1.5-fold higher odds of infections (0.8 vs 0.5 per 100 births).

At five and 10 minutes, the odds were progressively larger: 2.1-fold (1.7 vs 0.7 infections per 100 births) at 5 minutes, and 3.3-fold (2.9 vs 0.8 infections per 100 births) at 10 minutes.

A small change in Apgar score from 10 at five minutes to 9 at 10 minutes was also associated with increased risk, compared with a stable score of 10 at five and 10 minutes.

This is an observational study, and as such, can't establish cause, and the researchers point to some limitations, such as a lack of information about birth interventions that could influence Apgar scores.

Nevertheless, they say their study included over 1.5 million births over an 18-year period and they were able to account for important factors that could have affected the results.

In summary, the authors say their study shows that low Apgar scores within the normal range (7-10) "are strongly associated with neonatal mortality and morbidity and that these associations are substantially stronger with increasing time after [birth](#)."

They add: "Our findings provide strong evidence to support the proposition that the optimal Apgar score is 10 at each time point, and all newborns should be assigned an Apgar score at 10 minutes, regardless of their [score](#) at one and five minutes."

More information: Association between Apgar scores of 7 to 9 and

neonatal mortality and morbidity: population based cohort study of term infants in Sweden, www.bmj.com/content/365/bmj.11656

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