Original article

**The association of prenatal diagnoses with mortality and long-term morbidity in children with specific isolated congenital anomalies: a European register-based cohort study**

Running title: Prenatal diagnoses in children with congenital anomalies

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**Declarations**

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Conflicts of interest

All authors declare that they have no competing interests to declare.

Ethics approval

All EUROCAT registries obtained ethical, governance and other permissions for the data linkage according to their national legislations and arrangements.

Consent to participate

Not applicable, since data are based on previously collected data.

Consent for publication

Not applicable

Availability of data and material

Due to data protection issues data are not available. The data have been collected for this specific study with specific permissions. Each site can be contacted to get more detailed information, how similar data can be received for research purposes.

Code availability

Not applicable

Authors' contributions

Planning the study: EG, MG, AH, SK-K, JM. Acquisition of data: All authors. Analysis of data on local level: All authors. Analysis of data from all sites: MG, AH, SK-K, JM. Drafting the paper: MG, AH, SK-K, EG, JM. Revising the paper: All authors. Final approval of the paper: All authors.

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**ABSTRACT**

**Objectives:** To compare 5-year survival rate and morbidity in children with spina bifida, transposition of great arteries (TGA), congenital diaphragmatic hernia (CDH) or gastroschisis diagnosed prenatally with those diagnosed postnatally.

**Methods**: Population-based registers’ data were linked to hospital and mortality databases.

**Results:**Children whose anomaly was diagnosed prenatally (n=1088) had a lower mean gestational age than those diagnosed postnatally (n=1698) ranging from 8 days for CDH to 4 days for TGA. Children with CDH had the highest infant mortality rate with a significant difference (p<0.001) between those prenatally (359/1,000 births) and postnatally (116/1,000) diagnosed. For all four anomalies, the median length of hospital stay was significantly greater in children with a prenatal diagnosis than those postnatally diagnosed. Children with prenatally diagnosed spina bifida (79% vs 60%; p=0.002) were more likely to have surgery in the first week of life, with an indication that this also occurred in children with CDH (79% vs 69%; p=0.06).

**Conclusions:** Our findings do not show improved outcomes for prenatally diagnosed infants. For conditions where prenatal diagnoses were associated with greater mortality and morbidity, the findings might be attributed to increased detection of more severe anomalies. The increased mortality and morbidity in those diagnosed prenatally may be related to the lower mean gestational age (GA) at birth, leading to insufficient surfactant for respiratory effort. This is especially important for these four groups of children as they have to undergo anaesthesia and surgery shortly after birth. Appropriate prenatal counselling about the time and mode of delivery is needed.

**Keywords:** Congenital diaphragmatic hernia, Gastroschisis, Prenatal diagnosis, Spina bifida, Transposition of great arteries

**Significance:**

What is already known on this subject?

Prenatal detection of congenital anomalies has become more common with improvements in technology and increased accuracy of detection. Previous findings on the effect of timing of diagnoses on newborn outcomes are limited and conflicting.

What this study adds?

Our findings do not show better outcomes for prenatally diagnosed infants with spina bifida, transposition of great arteries, congenital diaphragmatic hernia or gastroschisis. More severe anomalies may be more likely to be prenatally detected. Appropriate prenatal counselling about the time and mode of delivery is needed.