The National Incidence and Outcomes of Gastroschisis Repairs

Abstract:

The National Incidence and Outcomes of Gastroschisis Repairs (NIGR) over a 5 year period (2007-2011) and clinical outcomes by a retrospective cohort review of neonatal intensive care unit (NICU) records in tertiary paediatric teaching hospitals. Patients with gastroschisis were identified. The NIGR per 10,000 live births was 1.96 (SD 0.51) per year. The overall antenatal detection rate in Ireland from 1998 to 2004 for anterior abdominal wall defects is reported as 75%. Antenatal screening with ultrasound has a high success rate in the detection of anterior abdominal wall defects with sensitivity and specificity of 92% and 97% respectively. The development of parental nutrition have reduced infant mortality rates for gastroschisis from 60% in the 1960s to 3-10% in the mid-1990s with no clear evidence of a reduction in mortality since then. Nationally and internationally surgical strategies for gastroschisis have evolved on limited evidence and no consensus on the optimal initial management or an effective clinical pathway.

Introduction

The birth prevalence of gastroschisis worldwide has increased over the past decades. We aim to determine the Irish national incidence of gastroschisis repairs (NIGR) over a 5 year period (2007-2011) and clinical outcomes by a retrospective cohort review of neonatal intensive care unit (NICU) records in tertiary paediatric teaching hospitals. Patients with gastroschisis were identified. The NIGR per 10,000 live births was 1.96 (SD 0.51) per year. The overall antenatal detection rate in Ireland from 1998 to 2004 for anterior abdominal wall defects is reported as 75%. Antenatal screening with ultrasound has a high success rate in the detection of anterior abdominal wall defects with sensitivity and specificity of 92% and 97% respectively. The development of parental nutrition have reduced infant mortality rates for gastroschisis from 60% in the 1960s to 3-10% in the mid-1990s with no clear evidence of a reduction in mortality since then. Nationally and internationally surgical strategies for gastroschisis have evolved on limited evidence and no consensus on the optimal initial management or an effective clinical pathway.

Results

In the period 2007-2011 a total of 70 infants had gastroschisis repairs. The NIGR per 10,000 live births is 1.96 (0.51) over the study period. Infants were born as late preterm infants with the median gestational age at 36(2) weeks. The antenatal detection rate for this cohort was at 83%. Seventy (70) infants with an antenatal diagnosis were postnatal transfers to the tertiary surgical centres from outside the Dublin maternity hospitals. Four children had concurrent cardiac abnormalities (patent ductus arteriosis, atrial septal defect, ventricular septal defect, aortic stenosis, and aortic incompetence) and none required cardiothoracic intervention during their initial admission. Three children had concurrent renal abnormalities (hydronephrosis, dysplasia and vesicoureteric reflux). A single child had a syndrome phenotype which has no associated genetic abnormality. No abnormal karyotypes were detected.

Discussion

Gastroschisis is challenging as its causes (a complex biomedical and sociocultural set of risk factors and developmental origin) are largely speculative or unknown. From a public health perspective it appears to disproportionately target children of young mothers and it is increasing in many countries worldwide. This study reveals that the NIGR is 1.96 per 10,000 live births during the study period 2007-2011. This corresponds to EUROCAT 2011-2012 registry prevalence rates for gastroschisis of 2.23, 2.05 and 1.82 per 10,000 births in Cork and Kerry, Dublin, and South East Ireland respectively. The antenatal detection rate of this condition is at 83% which is significantly higher than previously reported from Ireland.

This may be due to a multitude of factors including the improved local antenatal screening programs, despite the lack of consistent ultrasound screening throughout the country.
of a uniform national antenatal screening program. The postnatal benefits of prenatal diagnosis of gastroschisis include family awareness, adequate planning of delivery with alerted paediatric staff, optimal risk categorisation and a personalised protocol for action. The caesarean section rate is almost 49%. To further subdivide this figure into emergent and elective section we find that the elective rate stands at almost 13%. No studies have definitively shown the benefit of routine caesarean section for delivery.

This national cohort compares favourably with other national cohorts. Unfortunately our retrospective study, being subject to the flaws of such research, did not lend itself to collection of data upon suspected risks factors (due to the absence of uniform data documentation in clinical notes) such as smoking or concomitant illicit drug usage. Therefore a multivariate analysis of risk factors was not undertaken. Early neonatal deaths (albeit rare) at sites of referral could not be included. The strength of this study is its robust data collection of a national cohort over 5 years. This nationally representative study provides a benchmark against which individual centres can compare outcomes and performance. This study provides data which can be provided to parents regarding the clinical course spectrum in relation to gastroschisis repairs, and to define targets upon which improvement is sought. We recommend further local prospective studies with international collaborations to elucidate the risk factors, management strategies and outcomes.

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References
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