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All Island Congenital Heart Network Brings Diagnosis Closer to Home

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Abstract

Aim

The All-Island congenital heart network appointed paediatricians with expertise in cardiology in regional centres. Prior to these appointments children with suspected congenital heart disease were referred to the national children's heart centre for investigation. The aim of this study is to quantify paediatric cardiology activity in a regional Irish centre over the first year of service provision.

Methods

Data was collected retrospectively on all inpatient neonatal referrals over a 12-month period (January 2019 to January 2020).

Results

There were 268 neonatal referrals. Premature infants (< 37 weeks gestation) accounted for 26% (n= 69) of total neonatal referrals. Congenital cardiac disease was identified in 58.5% (n= 113) of referrals. Cardiac intervention in the first year of life was required in 24 infants, 12.2% of referrals (5.6% catheter and 6.6% surgery).

Discussion

Our report displays how clinical networks of care can reduce hospital transfers from regional neonatal centres for non-invasive cardiology investigations.

Introduction

Congenital cardiac defects are the most common congenital defects occurring in neonates[1]. The incidence is between 6-9 per 1,000 live births[2]. Early diagnosis has helped reduce overall mortality of infants suffering from congenital heart disease in recent decades, and worldwide access to non-invasive diagnostic methods have improved during this timeframe also[3]. However, all paediatric cardiac services in Ireland have been centralised in the National Children's Heart Centre (NCHC) in Dublin until recently.

The All Island congenital heart network was established in 2015 and aims to provide appropriate cardiac care, including diagnostics, for all children in Ireland as close to home as deemed appropriate[4]. Paediatricians with Expertise in Cardiology (PEC) are trained in paediatric cardiology including echocardiography diagnostic skills and have been appointed in regional paediatric centres across Ireland.

The first PEC was appointed to Cork University Hospital (CUH) in 2018. The aim of this study is to quantify paediatric cardiology activity in a tertiary neonatal unit during the first year of PEC services.

Methods

This retrospective study was conducted in Cork University Maternity Hospital (CUMH) which has approximately 7,500 deliveries annually[5]. A review of all neonatal cardiac referrals in CUMH over a one-year period from January 2019 to January 2020 was performed. Infant demographics, indications for referral, and outcomes were gathered using Cerner Millennium (2011), an electronic health record neonatal information system. Data analysis was performed using the program for statistical analysis of sampled data (SPSS 2020). Ethical approval was granted by Clinical Research Ethics Committee in university College Cork.

Results

A total of 268 neonatal referrals in 193 patients were received. Premature infants (< 37 weeks gestation) accounted for 19.6% (n=38) of all patients. The indications for referral were murmur 45% (n=87), cyanosis 20.7% (n=40), dysmorphism 19.6% (n=38), congenital anomaly 5.7% (n=11), and persistent tachypnoea 5.2% (n=10) (Figure 1).

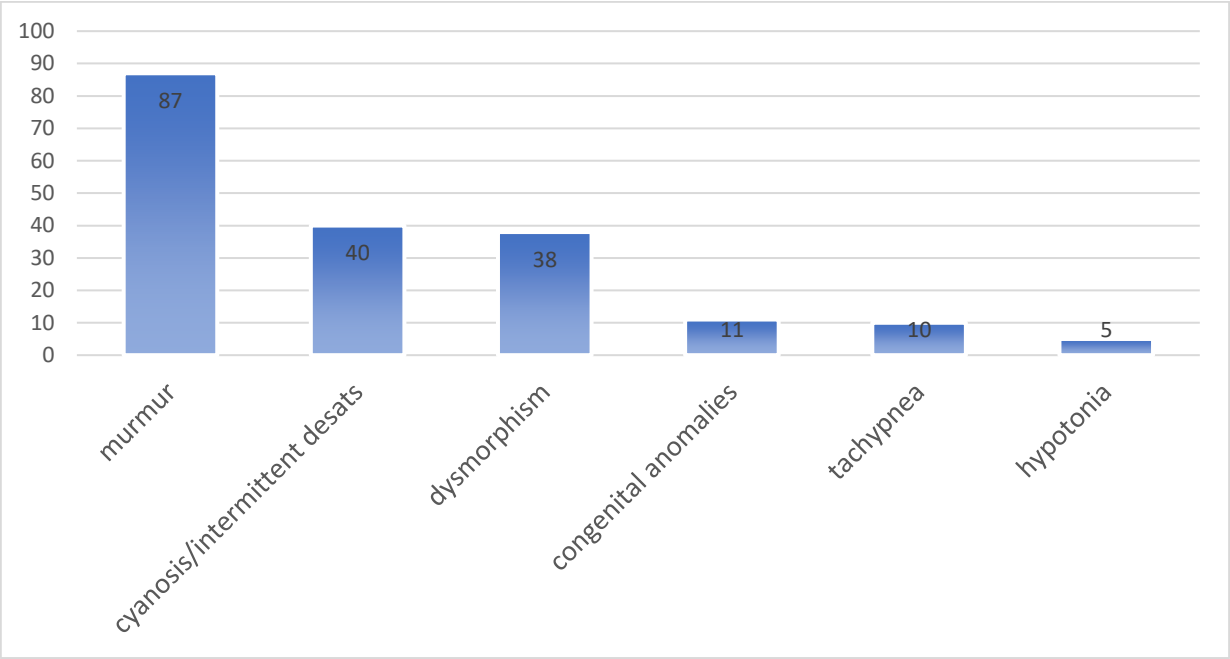

Figure 1. Indications for paediatric cardiology referral.

Congenital cardiac disease was identified in 58.5% (n= 113) of referrals. The most frequently found lesions in infants (N=193) were PDA 25.6% (n=50), VSD 15.6% (n=30), and ASD 11.2% (n=22). Other lesions included aortic stenosis (n=6, 3%), pulmonary stenosis (n=5, 3%), AVSD (n=3, 2%), cardiomyopathy (n=4, 2%), and tetralogy of fallot (n=3, 2%). Nine infants (5%) had pulmonary hypertension identified as a cause for symptoms. Cardiac intervention was required during the first year of life in 24 infants, 12.2% of referrals (5.6% catheter and 6.6% surgery).

Discussion

Referrals to paediatric cardiology services have increased exponentially over time[6]. Increasing access to paediatric cardiology diagnostic services to meet this demand is challenging. Prior to PEC appointments, diagnostic services for paediatric cardiology in Ireland took place centrally in the NCHC in Dublin. However, models based on a single centre result in unnecessary transfers, financial burden of travelling on families, increased parental anxiety, and also impact on the service provision of cardiac centres[7,8]. Methods for delivering appropriate paediatric cardiology services closer to home by a paediatrician or neonatologist with expertise in cardiology has been described in international models[9,10].

Our study illustrates that the impact of having access to non-invasive cardiac diagnostics in a regional paediatric centre. The majority of patients referred to our service did not have major cardiac pathology, and more than 85% of patients were managed locally.

This highlights the success of All-island CHD network in providing cardiology services as close to home as possible, reducing the frequency of transfers, and the burden on families. On the other hand, a significant number of infants were diagnosed with congenital cardiac disease requiring intervention in the first year of life, and had a diagnosis made with appropriate follow up in the NCHC arranged prior to discharge. Our findings highlight the role of PEC in filtering appropriate referrals to the NCHC.

Future studies can address the current patients' needs and assess the reduction of workload on tertiary centres in the network by using such models. They might also motivate other stakeholders to invest in such models for other specialities.

Declaration of Conflict of Interest:
The authors have no conflicts of interest to declare.

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