Quality Improvement and Patient Safety

658 TRENDS AND TECHNIQUES IN INFANT LUMBAR PUNCTURE – TOWARDS A MORE STANDARDISED APPROACH TO MAXIMISE PROCEDURE SUCCESS

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Background Lumbar puncture (LP) is commonly performed as part of a septic screen in infants under 3 months of age. The success rate is highly variable, between 50–70%, and many infants require multiple attempts.¹ Haemorrhagic cerebrospinal fluid (CSF) is often the result of incidental trauma during LP, and causes uncertainty when interpreting results. This may lead to delayed or missed diagnosis, unnecessary antibiotic therapy and prolonged admission. The procedure is uncomfortable for infants, and therefore ensuring successful CSF sampling is important.

Objectives To measure the local success rate of LP procedures in young infants, and investigate factors associated with failure. We also aimed to evaluate current preferences and techniques amongst paediatricians to identify areas to improve procedural success.

Methods The study was conducted in a large tertiary children's hospital. Outcomes for infants younger than 3 months undergoing LP were retrospectively analysed over a period of 2 months. All procedures were performed on a general paediatric ward or admissions unit. Outcomes measured included LP success at first attempt, rate of traumatic LP ($>1000 \times 10^6$ red cells/L or clotted), and number of failed attempts (dry tap).

A survey was then created to assess local practice. All general paediatric medical staff who had performed at least one LP were invited to participate in the survey. Questions were designed to investigate the preferences, techniques, training and experience of clinicians, and were targeted to local guidelines.

Results Over the study period, 21 LPs were performed in infants under 3 months of age. CSF was obtained on the first attempt in 23% of procedures, and on the second attempt in 54%. The CSF obtained was haemorrhagic in 50% of samples. In total out of all documented procedures, there were 14 (52%) unsuccessful attempts, 6 (22%) traumatic samples and 7 (26%) successful samples obtained.

The anonymous survey received 22 responses from general paediatric staff. The majority of respondents were senior trainees ST4–8 (41%), 7 were consultants and 6 were junior trainees. Most (77%) reported performing more than 10 LPs, and 23% had performed over 100 procedures. Despite this, only 18% had ever received formal LP training. Preferred technique varied between people: 91% opt for lateral flexed positioning, 27% use an early stylet removal method, and others described their variations of LP technique. Analgesia was offered routinely by only 82% of clinicians, and choice of analgesia varied widely with two thirds choosing sucrose. 95% of respondents thought the single most important factor in procedure success is good holding technique from the assistant.

Conclusions The majority of young infants undergoing a lumbar puncture require multiple attempts. The use of sucrose for analgesia is sporadic and 1 in 5 clinicians do not routinely offer any analgesia. Formal training for paediatric trainees and

assisting ward staff may offer avenues to improve the success of infant lumbar punctures.

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Paediatricians with Expertise in Cardiology Special Interest Group

659 OPTIMISING RESOURCES IN A SAFE AND EFFECTIVE NEONATAL MURMUR PATHWAY TO IMPROVE PATIENT CARE

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Background Neonatal heart murmurs are commonly heard during routine newborn examination. In our institution, babies found to have a murmur on the postnatal ward are reviewed in a registrar-led murmur clinic, ideally within 10 days. If the murmur persists, they are referred for review in an echocardiography clinic led by a Neonatologist with Expertise in Cardiology. We have recently introduced a paediatric echo technician to the pathway who is available to perform two echocardiograms each week.

Objectives We sought to assess the safety and efficacy of our neonatal murmur pathway. In addition, we evaluated whether the availability of the echo technician has reduced the echo waiting time.

Methods Data including referral dates, clinic dates and outcomes were collected retrospectively from the electronic patient records of all babies seen in both murmur and echo clinic from September 2019 to August 2020.

Results 265 babies were referred to the registrar-led murmur clinic. The median waiting time from referral to murmur clinic appointment was 13 days (IQR 9–17). The majority (68.8%) no longer had a murmur and were discharged from murmur clinic. 72 babies (27.1%) were referred to either the echo technician (29, 10.9%) or consultant echo clinic (43, 16.2%). Four babies (1.5%) were referred directly to cardiology from murmur clinic with concerning clinical findings. The median waiting time from murmur clinic to an echo was 43 days (IQR 19–93) overall; however amongst those who were seen by an echo technician the waiting time was 19 days (IQR 16.5–36). The overall waiting time has reduced from 48 days in a previous evaluation performed between April and December 2016.

Of the 72 babies referred for an echo 44% were found to have pathology. 14 babies (19%) had an atrial septal defect, ventricular septal defect, patent ductus arteriosus or combinations of these. Two patients had pulmonary stenosis, one a bicuspid aortic valve and aortic stenosis and one had turbulent flow in the left pulmonary artery and aorta. The remainder had an isolated finding of a patent foramen ovale.

No babies re-presented with signs or symptoms of congenital heart disease between discharge from postnatal ward and

murmur clinic appointment or after discharge from the murmur clinic.

Conclusions The provision of a registrar-led murmur clinic is a safe and effective screening tool for babies with a murmur. Following senior review all babies with murmur on the postnatal ward can therefore be safely discharged home in the first 24 hours after birth. In the absence of registrar availability, this screening clinic could be led by a general paediatrician or neonatologist. We have shown that this model can lead to a reduction in the number of babies requiring an echo by over two thirds. The introduction of echocardiography performed by the echo technician can further improve the waiting time for an echo.

We aim to improve neonatal trainee awareness of details of the pathway to ensure babies are discharged early from the postnatal ward with murmur clinic follow up, and that the echo technician appointments are utilised appropriately.

British Association of General Paediatrics

661 IDENTIFYING CHILDREN 'MISSING' DURING UK COVID-19 LOCKDOWN: A RETROSPECTIVE COHORT STUDY (2015–2020) OF OXFORDSHIRE ED ATTENDANCES AND INPATIENT DIAGNOSES

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Background On 23rd March 2020, the UK 'stay at home' order heralded the first national lockdown, lasting 7-weeks. Dramatic reductions of paediatric attendances/admissions were noted nationally and internationally, with concerns surrounding diagnosis which may be missing from secondary care.

We conducted a systematic review on 9th January 2021, searching PubMed for 'COVID', AND 'lockdown', AND 'paediatric' OR 'children', AND 'attendance' OR 'admission', in all languages using MESH terms. This identified n=41 primary articles exploring paediatric healthcare usage during a lockdown period. These covered Europe, Brazil, USA, Canada, Iran, and India. 44% examined ED settings only; 49% reported on admissions for a single disease or specialty; only 2 examined all inpatients.

No previous study has explored the changing patterns of diagnoses amongst all paediatric inpatients during a lockdown period, compared to historical years.

Objectives To establish the changing patterns of ED attendance and inpatient diagnoses across two Oxfordshire hospitals during the first COVID-19 lockdown in 2020, compared to five historical years (2015–2019).

Methods We retrospectively reviewed anonymised electronic records for all ED attendances and inpatients aged 0–15 years, across two Oxfordshire hospitals providing secondary and tertiary care services. Discharge ICD-10 coding were analysed to identify significant differences in lockdown inpatient diagnoses, compared to a matched 7-weeks in 2015–2019 (Mann-Whitney U test, admissions-per-week).

Results During the first 2020 lockdown period, 2,843 diagnoses were associated with 1,416 admissions (mean 4.81 diagnoses/patient), compared with 12,458 admissions and 19,946 diagnoses across matched dates 2015–2019 (2.97 diagnoses/

patient). Lockdown ED attendances (n=4030) and admissions (n=1416) were reduced by 56.8% and 59.4%, respectively, compared to 2015–2019 (mean n=7446.8 and n=2491.6, respectively). Proportions of admissions from ED and patients' subsequent length of stay were similar across all years. Reductions in hospital admissions were highest in 1–5-year-old (age <1 =48.4%, 1–5 =67.2%, 6–10 =53.3% and 11–15 years =48.9%).

We categorised diagnostic codes significantly reduced during lockdown ('missing') compared to 2015–2019: 80% were infectious diseases or their sequelae; non-specific pains/aches/malaise (11%) and accidental injury/poisonings (9%) accounted for the remaining 20%. Categories with increased diagnoses (24% of lockdown diagnoses) were 'related to pandemic screening', 'incidental finding/co-morbidity' and 'other diagnoses'. We also found significantly greater numbers of neoplasms (benign and malignant) diagnosed during lockdown (p=0.0123).

Conclusions Pandemic measures and messaging are altering paediatric disease presentation. Our study confirms large reductions in paediatric ED attendances and inpatient admissions during the first national lockdown, raising concerns of vulnerable children 'lost' to secondary care.

Our assessment of 'missing' paediatric diagnoses uses internationally comparable ICD-10 codes. We therefore postulate that the 80% of infection-related diagnoses 'missing' during the lockdown period are driven by a combination of stringent infection-control measures, parents/carers management of mild/self-limiting disease at home, and/or increased anxiety surrounding hospital attendance. As 20% were non-specific or accidental injuries, we remain concerned about significant disease with late presentations or patients with safeguarding concerns who may not be brought to hospital, amongst these patients.

Prospective studies are necessary to establish whether parents/carers are adequately supported, have adequate contact with health professionals and feel empowered to use referral pathways for hospital review.

British Association of Perinatal Medicine and Neonatal Society

665 DOES THE HOSPITAL OUTCOME OF BABIES (≥30 WEEKS) BETWEEN INBORN AND OUT BORN DIFFER? A SERVICE EVALUATION

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Background There has been less research into neonatal outcomes of those ≥30 weeks gestation, who could be cared for in a Level-1 unit. Additionally, the Northern Neonatal Network is unique due to the fact it does not contain Level-2 units.

Objectives Describe the characteristics and outcomes of babies (≥30 weeks) born in Level-1 transferred out for intensive care (out-born) compared with babies born at similar gestation born in level-3 (inborn).

Methods This retrospective study was conducted in a regional level-3 unit, with nine Level-1 units in the region. Using the