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DOES POINT OF CARE TESTING FOR RESPIRATORY VIRUSES ALTER MANAGEMENT OF CHILDREN PRESENTING TO THE PAEDIATRIC ACCIDENT AND EMERGENCY DEPARTMENT?

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Background Febrile and respiratory illnesses constitute a high proportion of presentations to Paediatric Accident and Emergency (A+E).¹ The diagnostic challenge is to determine which of these illnesses have a viral aetiology, and can be managed supportively, and which require cultures and prompt antibiotic administration. Point of Care Testing (POCT) for respiratory viruses provides a rapid result and may support immediate clinical judgement, whereas traditional PCR testing takes 6 – 24 hours. POCT is however more expensive.

Objectives We aimed to assess the impact of rapid POCT for influenza and respiratory syncytial virus (RSV) on the management of patients attending the Paediatric A&E department at the Royal Victoria Infirmary, Newcastle-upon-Tyne, between December 2019 and January 2020.

Methods Patients eligible for testing were infants <3 months presenting with fever and respiratory symptoms, children with complex needs (i.e. significant neuro-disability or immunocompromise) and cases where testing was felt likely to alter management, based on consultant discretion.

Data were collected retrospectively about clinical presentation, investigations and antibiotic management.

Results 150 patients were included; most aged between one and four years (38%) followed by those aged <3 months (17%). On POCT, 24% were influenza positive, 31.3% RSV positive and 46% negative.

We found a reduction in blood cultures performed in the POCT positive cohorts (19.4% (flu positive group), vs 14.9% (RSV positive group) vs 34.8% (negative group)) and similarly, a reduction in the rate of baseline blood tests taken (25% (flu positive group) vs 27.7% (RSV positive group) vs 55.1% (negative group)).

Furthermore, there was a reduction in antibiotic administration in the POCT positive groups (30.6% (flu positive group), vs 40.4% (RSV positive group) vs 50.7% (negative group)).

In the <3 months cohort; 57.1% of the negative POCT group had cultures and antibiotics, vs 33.3% of the flu positive and 12.5% of the RSV positive infants. Fever appeared to be a key determinant for antibiotic use in the RSV positive infants.

5 patients of the 150 had a central line in-situ. All presented with fever, had cultures performed and received antibiotics for possible line-related sepsis. The one child with a flu positive POCT received tamiflu in light of their immunocompromise.

Patients with significant neuro-disability and a negative POCT were found more likely to receive antibiotics relative to the negative POCT cohort as a whole (63.6% vs 50.7%), which perhaps reflects the vulnerability of this group.

Conclusions POCT for influenza and RSV may help avoid septic screening of infants <3 months, and reduce unnecessary blood sampling and antibiotic prescriptions in older children. It is unlikely to be useful in patients with central line access aside from in the case of suspected influenza when tamiflu administration may be warranted. Standard laboratory respiratory virus PCR should be performed where a result is required but will not alter immediate management.

Our next objective is to determine the cost-effectiveness of permanent point-of-care testing within our Paediatric A&E department.

REFERENCE

1. <https://adc.bmj.com/content/84/5/390>

British Paediatric Neurology Association

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RECURRENT CEREBRAL VENOUS SINUS THROMBOSES (CVST'S) AND LIVEDO RETICULARIS RASH – A CASE OF SNEDDON SYNDROME

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Background Sneddon syndrome is a rare, progressive small and medium-vessel vasculopathy characterized by the clinical occurrence of livedo racemosa and ischaemic cerebrovascular events.

Objectives We present the clinical course and management of this rare condition.

Methods An 18-year-old female of East Indian descent presented with the following:

CNS involvement: Recurrent Cerebral Venous Sinus Thromboses + Cognitive impairment

- Skin: Livedo reticularis rash
- Eyes: Bilateral optic nerves atrophy
- CVS: Mild to moderate LAD dilation (16/12/2020)
- MS: Polyarticular arthritis

She first presented at 8-years-old with new-onset squint, ataxia and fever and was treated as culture-negative meningitis (CSF white cells 1238 neutrophils, CSF protein 110mg/dL). At 16-years-old, she presented with expressive aphasia, headache, fever, left earache and was treated as acute mastoiditis.

Regarding the recurrent presentations of CVST's there was involvement of left transverse sinus (untreated 2 years ago), then over a 1-month period despite anticoagulation, right transverse sinus with extension into the right sigmoid sinus and left straight and posterior superior sagittal sinus. She presented with headache, vomiting and new-onset seizures (GTCS) prior to these presentations. An extension of this clot after being non-compliant with low-molecular weight heparin for 1 week resulted in a venous infarct with surrounding oedema. She presented with progressive right-sided weakness and expressive aphasia and within 24 hours,

encephalopathic with decerebrate posturing in subclinical status epilepticus.

She was managed in PICU for refractory status epilepticus and raised intracranial pressure.

There is also a family history of early stroke (maternal cousin with CVST at 8yo on long-term anticoagulation).

Results Her inflammatory markers continued to increase despite antibiotic coverage at meningitic doses and she was treated for a CNS vasculitis/Catastrophic Antiphospholipid syndrome with IV anticoagulation (UFH), high-dose steroids then IVIG. Her neurological state gradually improved (coma -> vegetative state -> minimally conscious -> conscious). This was followed by Rituximab therapy 375 mg/m² weekly x4. Her neurological function gradually improved as she was able to verbally communicate and developed anti-gravity movement of the right side.

Hypertension and fever also settled, and inflammatory markers steadily decreased post treatment.

Investigations:

ANA, dsDNA, ENA negative pANCA borderline positive but MPO, PR3 Antibodies negative

Anticardiolipin antibodies negative (on warfarin)

Infectious screen (HIV, Hepatitis, COVID-19 serology, Mantoux test, CSF Acid-fast bacilli) - negative

CSF cell count - 33 white cells (neutrophils), protein 183mg/dL

Skin biopsy report (26/11/2020) – Neutrophils, lymphocytes of leucocytoclasia seen in vessels of dermis. Thrombosis of fibrinoid necrosis of vessel walls and extravasated red blood cells also seen – Obstructive vasculopathy for clinical correlation; Possible Sneddon syndrome/Antiphospholipid syndrome

Conclusions There are few case reports describing the clinical course and treatment of this rare syndrome.

In our case, treatment for Catastrophic Antiphospholipid syndrome (steroids, IVIG, rituximab and anticoagulation) was beneficial in improving the clinical outcome.

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ULTRASOUND GUIDED VASCULAR ACCESS SHOULD BE ROUTINELY TAUGHT TO ALL PAEDIATRICIANS

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Background Paediatric vascular access can be notoriously difficult due to small vessels and patient cooperation. Studies have shown ultrasound (US) guided technique to be a more successful method of vascular access in experienced hands, especially in children with difficult access.

US guided vascular access is well established within adult medicine practice, especially emergency and intensive care, whereby point of care ultrasound (POCUS) is mandated. At present there is no standardised UK paediatric POCUS curriculum. Most UK paediatricians will not gain any US experience, unless undertaking acute sub-specialist placements.

Within district general hospitals (DGH), children with difficult access are often escalated to adult anaesthetists who are usually less experienced in paediatrics. Some children are transferred to tertiary centres where there is more US

expertise. To enable best patient care within their local setting, US guided paediatric vascular access should be routinely taught to paediatricians in DGH and tertiary settings

Objectives To date there have been no studies exploring the experience and significance of US guided vascular access training amongst DGH-based UK paediatricians. We developed US training sessions for paediatricians in our busy DGH, and evaluated their confidence levels, feedback and progress with this skill.

Methods Small-group sessions were led by our accredited and experienced paediatric advanced nurse practitioner (ANP) over a year. Two-hour sessions covered theoretical aspects and a practical session. Recommendations of practice bespoke to paediatrics were taught. Participants learned to map veins and practiced US cannulation on the gelatinous 'phantom' model.

A mixed-method research methodology was used to evaluate the course impact. A questionnaire was provided, asking attendees to evaluate confidence levels before and after sessions, and open-space for comments.

Results 30 paediatricians, from senior house officers to consultants, attended sessions. 75% had never conducted US vascular access and 96% did not feel confident prior to the session. Following sessions, 100% of participants felt significantly more confident, and would consider attempting this on real patients. Qualitative comments showed they valued the sessions: 'good opportunity to practice vein mapping and cannulation on gel model'. 100% felt US guided vascular access should be taught routinely within training. Five participants used this new skill, following the sessions, to undertake successful US- guided cannulation in acute resuscitation contexts.

Conclusions This study demonstrates the effectiveness and usefulness of delivering vascular access training to DGH paediatricians. It enabled improved self-reported confidence, which translated into improved patient care in real-life acute scenarios. However, further research in a larger cohort of participants is required to truly evaluate its impact.

We recommend that all UK paediatricians should be routinely trained in US guided vascular access, to promote better quality care for all paediatric patients within their local settings. The importance and role of US guided paediatric vascular access is still lacking in recognition, and demands wider acceptance. Further work is needed with appropriate stakeholders to endorse and prioritise the integration of this essential skill into the UK paediatric curriculum.

Quality Improvement and Patient Safety

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REDUCING THE ENVIRONMENTAL IMPACT OF INHALER USE AND DISPOSAL WITHIN PAEDIATRICS AND THE LOCAL COMMUNITY

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Background Doctors are becoming increasingly aware of the impact of healthcare on climate change, with the RCPCH declaring a climate emergency in October 2020. The NHS has set the goal to become world's first national health system to commit to 'carbon net zero'.