British Paediatric Allergy Immunity and Infection Group

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PAEDIATRIC INFLAMMATORY MULTISYSTEM SYNDROME TEMPORALLY ASSOCIATED WITH SEVERE ACUTE RESPIRATORY SYNDROME CORONAVIRUS 2 (PIMS-TS) AND VITAMIN D DEFICIENCY

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Background Coronavirus disease 2019 (COVID-19), has caused mild illness in children, until the emergence of the novel hyperinflammatory condition PIMS-TS: Paediatric Inflammatory Multisystem Syndrome Temporally associated with Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). PIMS-TS is thought to be a post- SARS-CoV-2 immune dysregulation with excessive inflammatory cytokine release.

Objectives There has been a long-standing interest in the role of 25 hydroxyvitamin D (25OHD) in cytokine-storm induced critical illnesses due to the premise of its anti-inflammatory actions including regulation of cytokine release. Vitamin D deficiency in critically ill individuals in intensive care has been linked to poor cardiovascular outcome and increased mortality.

We report the vitamin D status of children with PIMS-TS admitted to a single tertiary paediatric hospital in the Midlands region of the United Kingdom (U.K).

Methods We studied 25OHD levels in children admitted to a tertiary paediatric hospital in the U.K., fulfilling the case definition of PIMS-TS detailed by the Royal College of Paediatrics and Child Health. Children were managed either on paediatric intensive care unit (PICU group) or on the wards (non-PICU group). 25OHD concentrations were measured by quantitative liquid chromatography tandem mass spectrometry. Statistical analysis used a two-sample t-test, assuming unequal variances.

Results Fifty children [median (range) age 8.8 (0.99 to 14.6) years, male = 24] met the case definition. The majority were of Black, Asian and Minority Ethnic (BAME) origin [78%, 39/50]. SARS-CoV-2 IgG antibodies were confirmed in 64% (32/50) and SARS-CoV-2 RNA detected by PCR in 6% (3/50) of the study population. Of those patients without serology or PCR data available, the majority had a confirmed Covid 19 positive contact.

Eighty-two percent of the cohort were vitamin D deficient (<30nmol/L). The mean 25OHD concentration was significantly lower when compared to the population mean from the 2015/16 National Diet and Nutrition Survey, a cohort of healthy children with no medical conditions, aged 4–10 years [22 vs 54nmol/L (95% CI: 15.9, 24.1); $p<0.001$]. Children from BAME backgrounds had reduced vitamin D levels compared to children from a white background [mean 25OHD concentration 17.7 vs 28.2; $p=0.12$]. The PICU group had lower mean 25OHD concentrations compared to the non-PICU group, although this was not statistically significant [16.9 vs 28 nmol/L; $p=0.071$].

Conclusions PIMS-TS has seen an over-representation of children from BAME background, who are also at greatest risk of vitamin D deficiency. Whilst any link between vitamin D deficiency and the severity of COVID-19 and related conditions, including PIMS-TS, requires further evidence, public health

measures to improve vitamin D status of the U.K BAME population has been long overdue. Given the safety profile of vitamin D supplementation and the over-representation of BAME individuals with vitamin D deficiency and PIMS-TS, mandated year-round supplementation of all high-risk children should be the way forward.

Association of Paediatric Emergency Medicine

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THE UNFULFILLED POTENTIAL OF POINT-OF-CARE ULTRASOUND (POCUS) IN PAEDIATRIC EMERGENCY MEDICINE (PEM) TRAINING

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Background Point-of-care ultrasound (POCUS) has been an essential component of The Royal College of Emergency Medicine's higher speciality curriculum since 2010. However, it has only been part of the Paediatric Emergency Medicine (PEM) syllabus since 2018, with its use less well-embraced by the specialty. In comparison, POCUS has become increasingly established in PEM departments across North America, with widespread evidence supporting its diagnostic and procedural application in PEM. These successful practices highlight the potential for POCUS to be further implemented within PEM departments in the UK.

Objectives The absence of a standardised PEM-specific POCUS training program in the UK led us to suspect a possible wide disparity in the training and delivery of POCUS among PEM clinicians. Following on from the 2019 PERUKI study, which aimed to determine the current implementation and practices of POCUS in various PEM departments, we decided to focus in on and survey a cohort of trainees to evaluate their current opinions, experiences and attitudes towards POCUS in PEM.

Methods We created an online survey and distributed it in October 2020 to a sample of trainees from our tertiary paediatric site. The survey questions not only ascertained variation in POCUS experience and formal training, but had a novel focus in targeting the barriers to its more frequent implementation as well as the attitudes of the trainees towards the future of POCUS in PEM education.

Results We received a 56% response rate from the trainees invited to participate in the survey. Our results confirmed a deficiency in the standardised POCUS training amongst the PEM clinicians, with 89% having no PEM-specific POCUS training. We observed an underuse of POCUS at our site, with 76.9% stating they have 'never' used POCUS for diagnostic purposes. Despite this, >60% agreed with the statement that 'POCUS is a necessary addition to PEM', with zero disagreement. 100% of trainees voted that they would like further teaching, recognising the need for the development of a PEM-specific training curriculum before they can confidently utilise it in their day to day practice. 100% of the trainees believe that POCUS should be taught to postgraduates, 67% to undergraduates.

Conclusions The results of our survey have emphasised the need for a PEM-specific POCUS training pathway in the UK.