OC15

PAEDIATRIC MILD TRAUMATIC BRAIN INJURY IS ASSOCIATED WITH SYSTEMIC INFLAMMASOME ACTIVATION AND PUBERTAL SCORING

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Background Mild Traumatic Brain Injury (mTBI) is a common childhood occurrence with a more severe phenotype in adolescence. Systemic inflammation has been demonstrated to be integral to the pathogenesis of ongoing symptoms. The inflammasome is a component of innate immunity that is involved in regulating and inducing inflammation in response to cell damage and may have a modifiable role in mTBI.

Objective We demonstrated inflammasome pathway activation in response to mTBI. We hypothesized that pubertal development modulates inflammasome activation. We correlated pubertal scores with inflammasome gene transcription.

Methods Children were recruited to the study following presentation to the emergency department with symptomatic head injuries (GCS 14/15; n=21) and compared to age-matched Controls (n=10). Pubertal developmental self-rating scales (PDS) with 5 rating questions were administered with a maximum score of 20. mRNA was extracted from whole blood and the Inflammasome components [Interleukin (IL)-1 β and NLR Family Pyrin Domain Containing 3 (NLRP3)] in mTBI and controls were profiled with RT-PCR analysis on the ABI 7900.

Results The mean age of children recruited was 12.0($\pm$ 3.9) years with 18 males. Both NLRP3 and IL-1 β were significantly raised in the mTBI group versus controls (p<0.0001). IL-1 β was significantly downregulated at 2 weeks post TBI (p<0.0001). There was a significant correlation between pubertal score and IL-1 β in mTBI (p=0.04).

Conclusion Inflammasome activation via the NLRP3 pathway is important in paediatric mTBI. IL1 β activation was more prominent in children at more advanced stages of puberty. The interplay of pubertal maturity and the innate immune system may explain the greater burden of symptoms in patients during adolescence.

OC16

FEVER AS RISK FACTOR OF COMPLICATION IN CHILDREN HOSPITALIZED DUE TO RSV INFECTION

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Background Frequency of complications in children hospitalized due to *Respiratory Syncytial Virus* (RSV) infections is high, and fever is supposed to correlate with the risk of complications. The aim of the study was to assess the correlation between presence of fever, its magnitude, and duration and the risk of complications.

Material and methods 221 children (10 days to 91 months; median 3 months) were hospitalized due to RSV infection (2016/2017 and 2017/2018 seasons). 219 children met inclusion criteria (1 patient discharged on parents' request, and 1

with nosocomial infection were excluded). RSV infections were diagnosed with rapid antigen test and/or polymerase chain reaction. Acute otitis media (AOM) was diagnosed with otoscopy; pneumonia was confirmed with chest X-ray. We analyzed the highest fever, duration of fever, time of its presence (prior or during hospitalization).

Results Fever was present in 40% (88/219) patients, including 69 cases of fever prior and 55 during hospitalization (36 cases prior and during hospitalization). The risk of complications was higher in patients with fever (OR=6.09, 95%CI: 3.3–11.2), and it was more clearly pronounced in patients with longer (at least 3 days) duration of fever (OR=9.04, 95%CI: 4.2–19.4) than in patients with higher (at least 39°C) fever (OR=2.2, 95%CI: 0.7–6.5). Presence of fever was related with higher risk of both pneumonia and AOM (OR=5.27, 95%CI: 2.7–10.4, and OR=3.43, 95%CI: 1.5–7.7 respectively). Longer fever duration correlated with pneumonia more significantly than higher fever (OR=6.34, 95%CI: 3.1–13.1 vs. OR=0.94, 95%CI: 0.4–2.5). Similar correlation was observed in AOM (4.53, 95%CI: 2–10.2 for longer vs. OR=1.96, 95%CI: 0.7–5.6 for higher fever). Presence of fever showed AUC=0.76 (95%CI: 0.69–0.83; p<0.001) with cut-off value of 3 days showing 44% sensitivity and 91% specificity; 78% and 70% positive and negative predictive value respectively.

Conclusions Fever correlates with the risk of complications, but duration of fever seems to be crucial in terms of pneumonia and AOM.

OC17

EVALUATION OF CIRCADIAN MELATONIN SECRETION IN OBESE ADOLESCENTS

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Background and aims Obesity has been described as the epidemic of the 21st century. It is known that obesity may lead to a change in the main circadian rhythm – sleep-wake cycle, in which the melatonin (MLT) plays an especially important role, but little is known about circadian melatonin secretion in obese adolescents. The aim of this study was to measure 4-point saliva melatonin levels in obese adolescents and investigate circadian melatonin secretion relationship with obesity.

Materials and methods We studied 30 obese adolescents and 10 normal weight (NW) adolescents aged 15–17 years. Obesity and NW were determined if body mass index (BMI) Z-score >2 and BMI Z-score <1 for age and sex, respectively. All adolescents underwent polysomnography with the use of GRASS-TELEFACTOR Twin PSG (Comet) with As40 amplifier and an integrated module for sleep SPM-1 (USA) in order to verify any present sleep disorders. 18 obese adolescents with sleep apnea were excluded from the study. Non-stimulated saliva was used to determine the melatonin levels in 6.00–7.00, 12.00–13.00, 18.00–19.00 and 23.00–00.00 hours by an immunoassay using Buhlmann commercial sets (Switzerland) on the ELx808 Micro Plate Reader (USA). All differences were considered significant at p<0.05.

Results There were no significant differences related to age and sex between obesity and NW groups. A comparative analysis of the melatonin level in adolescents of main and control groups showed significantly lower melatonin levels both in evening hours (0.54 $\pm$ 0.51 pg/ml vs 2.13 $\pm$ 1.88 pg/ml,

respectively, $Z=2.266$, $p=0.023$) and at night (4.3 ± 6.12 pg/ml vs 13.79 ± 5.931 pg/ml, respectively, $Z=2.888$, $p=0.004$) in obese patients. Morning and day melatonin levels in both groups showed no significant differences, but there is a trend towards its increasing in obese adolescents in the morning hours (4.73 ± 3.23 pg/ml in main group and 4.32 ± 2.35 pg/ml in control group, $Z=0.044$, $p=0.965$).

Conclusions The results of this study indicate a significant decrease in the melatonin levels and disturbance of the melatonin production rhythm. In obese adolescents, we revealed a trend towards melatonin secretion shift to the early morning, when the melatonin level must decrease in healthy adolescents. Because of the varied roles of melatonin in human metabolic rhythms (insulin, leptin, adiponectin secretion and other biological active substances), these results suggest that to return to a normal rhythmicity and to lose weight, melatonin administration in evening hours and morning bright light therapy are reasonable and necessary.

OC18

A NOVEL STANDARDISED PROTOCOL FOR POST-OPERATIVE ANTIBIOTIC USE IN APPENDICITIS. RBHSC STUDY RESULTS AT SIX MONTHS

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Background Variation persists nationwide in the post-operative management of complicated appendicitis. Following a review of recent publications, it seems that the most beneficial change to patient outcome is the use of a standardised departmental approach. This has been shown to be effective in multiple centres using clinical findings and white cell count (WCC). A local review however suggested that in our patient population, post-operative complications were more strongly correlated with elevated C-reactive protein (CRP).

We implemented a novel protocol using CRP with clinical findings to standardise our post-operative antibiotic use and here present our findings after six months

Methods A prospective data collection was completed to assess:

Complicated appendicitis rate (operator observed perforated or gangrenous appendix)

Post-operative length of stay

Infective complication rate (Abscess or wound infection of Clavien Dindo Grade 2+)

This was compared to all patients undergoing an appendectomy over the previous six months.

Results 42 patients completed the new protocol over six months (New), with 53 in the six months prior (Prior).

New vs Prior; Age range was similar: 9 (6–12 IQR) vs 9 (7–11) and normal appendectomy rate improved 4.7% (2/42) vs 11.3% (6/53).

Complicated appendicitis rate was 50% (21/42) vs 42% (22/53).

Mean post-operative length of stay for the complicated group did not change, 5.6 vs 5.9 days ($p=0.38$), and improved in the simple group, 2.1 v 3.1 days ($p=0.01$).

Infective complication rate improved on the new protocol 9% (2/22) vs 27% (6/22).

Conclusions After six months with the New protocol the post-operative length of stay did not increase for patients with

complicated appendicitis and improved for those with simple appendicitis.

Significantly the rate of post-operative infective complications has fallen.

Our group hypothesise that the use of a standardised approach provides parents and staff with a clear post-operative plan and expedites discharge for patients with simple appendicitis. It also rationalises blood sampling and the antibiotic regimen appears to reduce infective complications.

We plan to continue using the protocol and will review our results at one year.

OC19

CHANGING THE SAFETY PARADIGM – BRINGING SITUATION AWARENESS TO THE FORE

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Context Situation Awareness for Everyone (SAFE) is a patient safety programme developed by RCPCH in London as part of a Health Foundation Initiative Closing the Gap in Patients Safety. The evolution of the programme was to take complex patient safety theory and methodology and translate it into day to day clinical practice.

Problem Deterioration of children is a major problem worldwide, in all contexts. Patient safety has yet to find ways to protect children from missed or delayed diagnosis and this programme aimed at developing proactive anticipation of deterioration to prevent adverse outcomes. This is against a background of variable levels of safety culture and a belief system that may not facilitate continual improvement.

Intervention This programme was run in four waves; in 2014–2016 three waves were held involving 28 clinical teams across England including all the leading children's hospitals. The final wave was held in 2017 with a further 23 hospitals. Over the course of the programme we developed new ways of bringing the patient safety concepts to the frontline staff. The actual intervention was a structured safety huddle which was held regularly in different settings. The aim was to bring situation awareness or a shared understanding of clinical conditions of children for staff. This approach integrated risk management, human factors, resilient engineering and reliability theory within a person focussed framework, while implementing multidisciplinary team huddles, which allowed participants to learn how to predict the changes in clinical status of children, rather than react to them.

Measurement of improvement This programme underwent an extensive evaluation which focused on the cultural changes, the changes in discourse and the clinical outcomes. We will be reporting on the final evaluation with a focus on how the programme has changed the way teams interact and how this could have an impact on clinical outcomes.

Effects of changes We will report a change in the way teams interacted, a change in the language they used, and a change in some clinical outcomes. We will also provide reflections on how to spread and sustain such initiatives.

PLEASE NOTE some aspects of this project have been published; the presentation will refer to these, offering a different perspective.