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DESCRIBING A MINI OUTBREAK OF RESPIRATORY SYNCYTIAL VIRUS IN A PAEDIATRIC ONCOLOGY UNIT

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Background: Respiratory syncytial virus (RSV) is a leading cause of respiratory tract infections in childhood. A substantial proportion of morbidity occurs in immunocompromised hosts. Due to unavailability of measures such as strict isolation and Palivizumab prophylaxis in most LMICs it is important to identify other measures to curb outbreaks. We report a mini outbreak of RSV that occurred in our unit coinciding with seasonal RSV transmission. Our aims were to investigate the source of outbreak (community or nosocomial) and describe course and outcomes in children with cancer.

Methods: This retrospective file review was carried out in the division of paediatric oncology, exposures and outcomes were collected in a structured proforma. RSV was diagnosed by RT PCR, from a nasal swab/nasopharyngeal swab/BAL/Mini BAL sample.

Results: Excluding the neonatal unit, 26 patients were diagnosed with RSV during September 2021 of which 10 were receiving treatment for cancer. The epidemic curve revealed a propagated source outbreak. Of these 10 patients, 2 had a family member with influenza like symptoms, all the remaining patients had visited the hospital in the week prior to symptom onset, hence the source was determined to be nosocomial. Mortality rate in children with cancer was 33% compared to 12.5% in children without underlying malignancies (p = 0.35). Co-infection with other respiratory viruses was seen in 50% of children with cancer and 12.5% of the children without underlying malignancy (p = 0.03). Isolation facilities were unavailable for the admitted patients and none received Palivizumab.

Conclusions: Our experience during this nosocomial outbreak revealed that prevention of unnecessary hospital visits and overcrowding during RSV season is a key area of intervention, especially considering higher mortality and a significantly higher incidence of co-infections in our population. With lack of easily available specific treatment, prevention, rather than cure is essential.

PROBLEM BASED FOCUSED LEARNING MODULES TO IMPROVE KNOWLEDGE OF MANAGEMENT OF ONCOLOGICAL EMERGENCIES

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Background: Outcomes of pediatric cancers in India are poorer compared to their western counterparts. This is contributed in part due to delay in diagnosis/referral and inappropriate management of the oncological emergencies at the presentation by general practitioners/pediatricians. Problem-based learning modules of oncological emergencies teaching evidence-based practices can improve knowledge and consequently their management by Pediatricians and contribute to better outcomes of paediatric cancers in India.

Methods: Evidence-based management of four common oncological emergencies (Febrile Neutropenia/ Tumor Lysis Syndrome/Superior Mediastinal Syndrome/Hyperleukocytosis) were taught using problem-based focussed learning modules of 20 minutes each to MD residents pursuing Pediatrics from various hospitals in Delhi by DM fellows in Paediatric Oncology. A 20–multiple choice question–based online pretest using Google Forms totaling 80 marks was given to assess baseline knowledge and the same test was attempted post-completion of the learning modules.

Results: Forty-nine residents attended and attempted the Pretest at the beginning of the module. The mean score was 46.69 with a median score of 44. However, only Twenty-one residents attempted the post-test. The mean pretest score of twenty-one residents was 45.14 (8.01) which improved to 61.90(10.85) in the test conducted post-completion of the module. This higher mean score and improvement in the mean score as per paired t-test were statistically highly significant (p<0.001).

Conclusions: Short duration problem-based learning modules resulted in significant improvement in knowledge of oncological emergencies of MD residents and can translate into better initial clinical management of oncological emergencies and similar problem based focussed learning modules conducted regularly as part of continuing medical education (CME) can result in better outcome of pediatric cancers in India.

COVID-19 MIMICKING HUS IN A TODDLER

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Background: Unusual hematological presentation of COVID 19

Methods: Case report

Results: Thrombotic microangiopathy (TMA), a triad of hemolytic anemia, thrombocytopenia and end organ damage, is present in severe COVID-19 and Hemolytic uremic syndrome (HUS). Classic HUS is commonly caused by Shiga toxin (ST) producing Escherichia coli. We report a toddler with features of classic HUS with positive PCR testing for SARS-CoV-2.

Conclusion: Both COVID-19 and HUS cause severe endothelial dysfunction resulting in release of inflammatory cytokines, complement dysregulation, and development of TMA.

CONDITIONS: PRELIMINARY FINDINGS

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Background: Childhood cancers cover a broad range of malignancies that are distinguished by factors such as age and sex of the child, histology, site of occurrence. Besides the medical effects of cancer, psychological components are also affected in children and caregivers. Sleep is one such factor that is significantly affected during treatment and may thereby affect daily functioning, lead to caregiver burnout, cause cognitive deficits, etc putting the child who is dependent on the caregiver at risk.

Aim: This study aimed at understanding the quality of sleep in caregivers of pediatric patients diagnosed with various childhood cancers.

Methods: A cross-sectional study of primary caregivers of children diagnosed with various Oncology conditions admitted in the hospital were included. A total of 75 caregivers (n–75) of children diagnosed with various oncological conditions were assessed. The assessment was carried out at two time points- the time of admission, to assess sleep at home, and at the time of discharge to understand the quality of sleep in hospital.
Basic socio-demographic details and the Pittsburgh Sleep Quality Index (PSQI) were administered.

Results: The socio-demographic findings suggested that caregivers were primarily mothers (89.3%) while a small number were fathers (9.3%) and grandmothers (1.3%). The global scores of PSQI indicated that 80% of caregivers had scores above the cut-off score of 5 at the time of admission and 90% had scores above 5 at the time of discharge indicating significant sleep disturbances. The average scores on individual subscales such as sleep efficiency, sleep duration, daytime dysfunction were seen to be affected between admission and discharge.

Conclusions: Understanding and addressing factors that can help improve the quality of sleep in caregivers may be useful in promoting psychological health of caregivers of children with cancer as well as the care needs of the patient themselves.

ROLE OF LONG NON-CODING RNA HOTAIRM1 IN THE PATHOGENESIS OF PAEDIATRIC ACUTE MYELOID LEUKAEMIA

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Background: The role of long non-coding RNA HOTAIRM1 in acute myeloid leukemia (AML) is unknown. We aim to study its expression and mechanism as we hypothesize that HOTAIRM1 is involved in the pathogenesis of paediatric AML.

Methods: Six AML cell lines (Kasumi-1, THP1, HL-60, KG1, MOLM-13, MOLM-14) were cultured in 10% fetal bovine serum supplemented RPMI-1640 media. Bone-marrow samples from 26 paediatric AML patients and 10 normal marrows were included in the study. The expression of HOTAIRM1 was quantified using qPCR. Downstream microRNA targets of HOTAIRM1 were predicted using DIANA-miRBase and RNAHybrid. The microRNA binding region on HOTAIRM1 was cloned into the pmirGLO vector, and interaction was studied using dual-luciferase assay. Cell cycle analysis was performed by quantifying 7-AAD and apoptosis assay by the annexin-PI method using flow cytometry.

Results: Expression of HOTAIRM1 transcript variant HM1V1 was down-regulated in HL-60, MOLM-13, and MOLM-14 cell lines (p < 0.05), whereas HM1V2 was downregulated in all cell lines (KG1, Kasumi-1, THP1, MOLM-13 p < 0.01 and HL-60, MOLM14 p < 0.001). In AML marrow samples, both variants were downregulated more than two-fold (HM1V1 p = 0.0007, HM1V2 p = 0.0023). Contrarily, the expression of predicted HOTAIRM1 microRNA targets were upregulated in AML cell lines (miR221-3p p < 0.001, miR222-3p p < 0.001), marrow samples (miR222 p < 0.0001; miR221 p = 0.0345) and peripheral blood samples (miR222, p < 0.0005; miR221 p = 0.431). Co-transfection of pmirHM1 and miR222 mimic in HEK293T cells decreased luciferase activity (p < 0.01) demonstrating in vitro interaction. Additionally, inhibition of miR222 in a paediatric AML cell line led to cell cycle arrest (p < 0.01) and increased apoptosis (p < 0.01).

Conclusions: The inverse expression of HOTAIRM1 and its predicted target, miR222 indicated a potential regulatory interaction between the two that was validated in-vitro. MiR222 acts downstream of HOTAIRM1 to promote cell cycle turnover of myeloblasts while inhibiting apoptosis thereby supporting our hypothesis for the role of HOTAIRM1-miR222 in the pathogenesis of paediatric AML.

PSYCHOLOGICAL IMPACT OF ART THERAPY ON CHILDREN UNDERGOING LEUKAEMIA TREATMENT

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Background: Cancer chemotherapy is associated with significant morbidity along with pain, mood swings anxiety and depression. Art therapy improves the physical, mental, and emotional wellbeing especially of children with cancer. Here, we share our experience of art therapy in children with acute lymphoblastic leukemia (ALL) who were undergoing chemotherapy.

Methods: Twenty children with ALL undergoing chemotherapy were approached for art therapy. Fourteen children participated after written consent from parents. Basic information was recorded. They were asked to draw and colour a picture of their family as a part of art therapy. A psychologist reviewed their paintings and interviewed them before and after art therapy to know about their feelings.

Results: Out of 14 children, ten were males and four females. Median age was 11 years (Range: 5–18 years). All children made picture of their family members. Four children also painted few extra articles. Five children drew only family members indicating loneliness and nine drew themselves along with the family indicating close connection with family. Even if the patient was not good at drawing, they can draw smiling faces and depict happiness in their drawing. Psychologist reviewed all paintings and commented that all paintings except one showed that the person making the painting was enjoying art therapy. Then on post-therapy interview by psychologist, 2/14 described no improvement in their mood after session, while 12/14 children described their art therapy experience as helpful and relaxing and relief in their pain and anxiety levels.

Conclusions: Art therapy is a novel and valuable technique for children with cancer to cope with their illness and treatment as it improves mood, and reduce anxiety and pain levels.

AN AUDIT OF DOCUMENTED INFECTIONS IN PEDIATRIC PATIENTS WITH HEMATOLOGICAL MALIGNANCIES AT A TERTIARY CARE CENTRE IN SOUTH INDIA IN 2021

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Background: Children with haematological malignancy have a high risk of infection during the course of their treatment. The institution follows fluconazole prophylaxis for all patients with hematologic malignancy and indwelling catheters. Co-Trimoxazole prophylaxis is used for all patients with Acute lymphoblastic leukemia (ALL), Fluoroquinolone prophylaxis given during neutropenia for all patients with Hematologic Malignancies. Patients with Acute Myeloid Leukemia (AML) receive Posaconazole as fungal prophylaxis during neutropenia. We conducted an audit of infections documented in children with hematological malignancy at our institution in the year 2021.

AIMS: To analyse the spectrum and the immediate outcome of documented infections in children with haematological malignancies in the year 2021.

Methods: After Institutional research board approval, electronic medical records of all visits of patients between 1 and 18 years of age with hematologic malignancies treated at the institution in 2021 were screened. All investigations done for identifying infection were reviewed. Positive reports of Blood and Urine cultures, Broncho alveolar lavage Culture, Nasal/oropharyngeal swab Polymerase Chain Reaction, Tzanck smear, Histopathological examination were noted. Every infection was documented and the immediate outcome recorded. The data was compiled and analysed using Microsoft office Excel 2019 version.

Results: There were 47 patients between 1 and 18 years. The cohort comprised of 37 patients with ALL, 6 patients with AML and 4 patients with Hodgkins lymphoma. A total of 183 admissions were recorded. Of 87 documented febrile neutropenia during these admissions, 44 had documented infections. There were equal number of documented Bacterial and Viral infections in the cohort (n = 20; 45%). The commonest isolated bacterial species was Burkholderia (n = 5; 11%). SARS COVID 19 was the commonest viral infection (n = 10; 22.7%). Aspergillus species was the commonest fungal isolate (n = 4; 9%). All patients were alive at last follow-up.

Conclusions: SARS Covid 19 was the commonest documented infection in the cohort. Burkholderia species was the commonest Gramnegative isolate and Aspergillus was the predominant fungal isolate as against Klebsiella, Pseudomonas and Candida species respectively in other studies.