Pedia Companion

Volume 3 | Issue 13 | 2024

Dear Doctor,
Greetings from Micro Labs Limited. We are happy to bring you "PEDIA COMPANION" which contain latest and interesting news in the field of Paediatrics.

This issue contains:

Should you require any specific article or medical information, please feel free to contact us at medicalservices@microlabs.in
Looking forward to your valuable feedback

Best Regards,
Medical Team, Micro Labs Limited

Pedia Companion

Volume 3 | Issue 13 | 2024

Evaluation of persistence of asthma in young children with severe bronchial hyperresponsiveness along with house dust mite allergy

Introduction

Presence of house dust mite allergy indicates a persistence of asthma beyond infancy.

Asthma is characterized by inflammation that causes bronchoconstriction, edema, and increased mucus production in the airways. Asthma is the most prevalent chronic illness in childhood, that affects 8.3% of children in the united states.[1] Asthma is imposing a high lifetime burden on patients, their caregivers, and healthcare systems. Multiple studies have demonstrated that early bronchial hyperresponsiveness (BHR) presence, even in asymptomatic individuals, was predictive of developing asthma in the future. Furthermore, a strong predictor of persistent asthma was the existence of sensitisation to house dust mite allergy (HDM).[2] The purpose of this study was to investigate the evolution of BHR, which was defined by recurring methacholine provocation tests (MCT), in young children without allergic sensitization and with HDM.

Methods

A retrospective analysis was carried out on preschool asthmatics, with patients ≤6 years of age diagnosed with asthma. Patients were screened for bronchial hyperresponsiveness. All the patients who met criteria were divided into two groups, Group 1 (No sensitization was detected in the skin prick test, SPT) and Group 2 (A positive SPT). Patients' groups 1 and 2 were analysed in three age ranges at the end of observation: age 5–6, age 7–9, and age >9 years, respectively, in order to define asthma persistence according to age and BHR.

Results

A total of 4970 pediatric subjects were diagnosed with asthma. 47 patients of group 1 and 48 patients of group 2 showed a severe BHR <0.1mg at the first visit. Patients in group 2 were more likely to still have a severe BHR than those in group 1 at the end of the follow-up (severe BHR group 1: n= 5 (10.6%) vs. group 2: n= 21 (43.8%), p= 0.004). At the most recent MCT, 89% of group 1 had only mild to moderate or no BHR, compared to 56.2% of group 2.

Independent of age, BHR persisted in the majority of HDM-allergic patients.

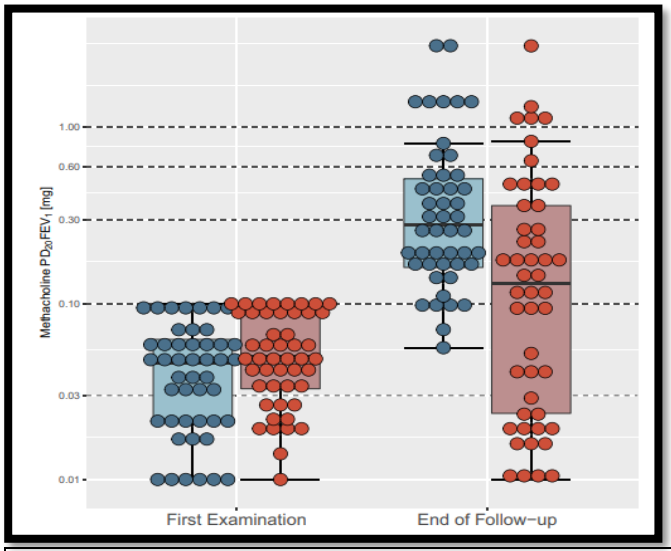


Figure 1. MCT examination at first and at end of follow-up where group 1 as blue and group 2 as red

In most HDM-allergic patients, BHR persisted irrespective of age. 20 of the 48 HDM-allergic patients (group 2) were mono-sensitized to HDM alone, whereas 28 (58.33%) were poly-sensitized by the end of observation. Patients who were poly-sensitized experienced the following allergies: n=20 grass and birch pollen, n=17 cat dander, n=7 dog dander, and n=4 alternaria. Poly-sensitized patients had increased eNO, which suggests a higher severity and burden of disease.

Discussion

In this study, the duration of severe BHR as determined by MCT was examined as a predictor of asthma in young children with HDM allergy and without allergic sensitisation. Our findings show that severe BHR in young children without allergic sensitisation tends to disappear until school age with a probability of approximately 89%, whereas severe BHR was likely to persist in children with HDM allergy. As a result, the current study clearly demonstrated the prognostic importance of early allergic sensitisation to HDM as a sign of persistent asthma.[2] Similar results were found in Burman et al. who performed allergic sensitisation in children with bronchial hyper-responsiveness. Sensitisation was associated with BHR which was measured by both the methacholine test and the free-running test. While it concluded that allergic sensitisation did not affect BHR in children without respiratory symptoms.[3]

Conclusion

This investigation, provided the information on methacholine provocation test's diagnostic and prognostic significance for preschool asthma and HDM allergy. This study concluded that patients with severe bronchial hyperresponsiveness and house dust mite allergy have a high risk of persistent asthma in later life.

References

1. Trivedi M, Denton E. Asthma in children and adults—what are the differences and what can they tell us about asthma? Frontiers in pediatrics. 2019 Jun 25;7:256.
2. Donath H, Klenner H, Hutter M, Meoli A, Trischler J, Schulze J, Blumchen K, Zielen S. Severe bronchial hyperresponsiveness along with house dust mite allergy indicates persistence of asthma in young children. Pediatric Allergy and Immunology. 2023 Dec;34(12):e14047.
3. Burman JI, Remes ST, Mäkelä MJ. Allergic sensitisation did not affect bronchial hyper-responsiveness in children without respiratory tract symptoms. Acta Paediatrica. 2022 Feb;111(2):424-31.

Pedia Companion

Volume 3 | Issue 13 | 2024

Evaluation of the association between sleep duration and liver steatosis in children based on body adiposity

Introduction

Sleep time plays an important role in the relationship between body fat distribution and liver disease in children's.

The World Health Organisation (WHO) defines overweight and obesity as abnormal or excessive accumulation of body fat that frequently impairs health.[1] On average, about one-third of our lifetime being spent in sleeping. The immune system, endocrine system, and cardiovascular health have all been shown to be significantly affected by sleep. Epidemiological studies have shown short sleep duration has also been linked to obesity, metabolic syndrome, and cardiovascular disease.[2] The most common cause of chronic liver disease in children and adolescents was metabolic dysfunction-associated steatotic liver disease (MASLD). Multiple studies suggested that insufficient sleep duration and quality may contribute to fat depot enlargement and the development of overweight and obesity.[1] However, this study aimed to analyse the possible interaction of sleep duration with different liver markers and whether this interplay was related to underlying adiposity in children and adolescents.

Methods

A cross-sectional longitudinal study was carried out on all children and adolescents with overweight or obesity. A total of 854 children and adolescents under 18 years of age were included. Measurement of anthropometry, clinical status, and biochemistry were conducted on children and adolescents (2–18 years old) who were overweight or obese and descriptive analysis was carried out. Body fat distribution were classified as normal, pear, or apple-shaped body fat distribution. Clinical assessments were conducted to determine the distribution of body fat, and several hepatic indicators were calculated, including hepatic steatosis index (HSI). Multiple linear regression models were used to evaluate liver damage, with HSI as proxy for liver disease.

Results

The anthropometric variables showed a significant increase in older children and children with obesity, compared to younger children and children with overweight. During the work week, children who were overweight and younger (3 and 6 years) slept considerably more hours each day than children who were obese and older. The concentrations of HDL-c ($p<0.001$) was higher in children with overweight than in children with obesity, while SBP ($p<0.001$), HOMA-IR ($p=0.0133$), CRP ($p<0.001$), LDL-c ($p=0.0157$), and GGT ($p=0.0277$) were significantly higher in children with obesity than in children with overweight. HSI was found to have a significant inverse correlation with sleep time although a positive correlation with

consumption of sweet drinks and screen time was observed. Second regression model showed a significant interaction between sleep time in hours and BMI z-score was found (p=0.001). Change in HSI by hours of sleep was plotted (Figure 1). This model illustrated how HSI decreased in children who were obese (BMI z-score >3) as sleep hours' increase, but HSI remained stable in children who were overweight (BMI z-score between 2 and 3), independent of sleep duration, and below the HSI cut-off. The HSI (34.1 vs. 40.0) was higher in obese children than in overweight children. The development of liver steatosis was observed to be more detrimental (p<0.001) to a pear-shaped body fat distribution in this study (HSI=44.1; CI, 40.6; 48.2) than to a normal distribution (HSI=37.3; CI, 34.1; 41.7). Mediation model showed that about 39% of the association of body fat distribution on liver steatosis (HSI index) was mediated by sleep time per day. Hence proving that there was an association between sleep time and body composition, which in turn was related to liver health.

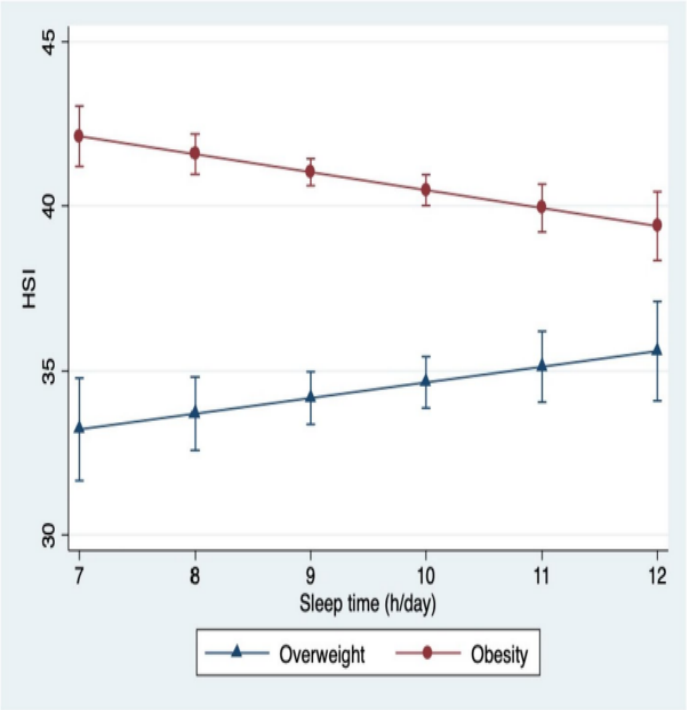


Figure 1. Modifications in HSI and sleep time and body weight categories in children and adolescents who are overweight and obesity

Discussion

This study showed an inverse association between liver disease measured through HSI and sleep duration. obese children showed higher HSI in both apple and pear shapes when compared to overweight children. A common pattern in metabolic diseases was that children and adolescents who had higher HSI, an indication of more severe steatosis, expressed better reductional outcomes when sleep time (hours/day) was increased.[1] Previous study reported a result of positive link between BMI to sleep duration in children's, with subjects who sleep less, having a higher BMI.[3] Risk of fatty liver disease was increased by short sleep duration and poor sleep quality. In this study, about 39% of the association of body fat distribution on liver steatosis (HSI index) was mediated by sleep duration. This result was supported by results from Imaizumi et al. which found that short sleep duration tends to be associated with MASLD which may be mediated by abdominal body adiposity in adult women.[4]

Conclusion

Sleep time plays an important role in the relationship between body fat distribution and liver disease. Among children who were overweight or obese, sleep duration affected 39% of the effect of body fat distribution on HSI. This study results suggested that healthy sleep pattern may be beneficial and suitable in the management of liver steatosis in children and adolescents with overweight and obesity.

References

1. de Cuevillas B, Lubrecht J, Navas-Carretero S, Vreugdenhil A, Martinez JA. Sleep duration is associated with liver steatosis in children depending on body adiposity. European Journal of Pediatrics. 2023 Nov 25:1-1.
2. Um YJ et al (2021) Sleep duration, sleep quality, and the development of nonalcoholic fatty liver disease: a cohort study. Clin Transl Gastroenterol 12(10):e00417
3. Ryan DH, Yockey SR. Weight loss and improvement in comorbidity: diferences at 5%, 10%, 15%, and over. Curr Obes Rep. 2017; 6(2):187.
4. Imaizumi H et al. The association between sleep duration and non-alcoholic fatty liver disease among Japanese men and women. Obes Facts. 2015; 8(4):234–242

Evaluation of the relationship between ABO blood group and gastric ulcer

Introduction

Blood group O has the higher risk of gastric ulcer disease

Gastric ulcer occurs when there was an imbalance between hydrochloric acid secretion and stomach mucosa which defies hydrochloric acid digestion. Ulcer might be present in duodenum, stomach, oesophagus and the jejunum. Stomach acid levels are higher in people with type O blood group and lowest in people with type A blood group.[1] A gene on chromosome nine's long arm encodes the ABO blood grouping system, which was the most frequently used. The ABO glycosyltransferases progressively synthesise carbohydrate molecules to generate the A and B antigens, which are controlled by this gene.[2] This study aimed to investigate the association between ABO blood groups and gastric ulcer and to evaluate the levels of serum gastrin and plasma leptin.

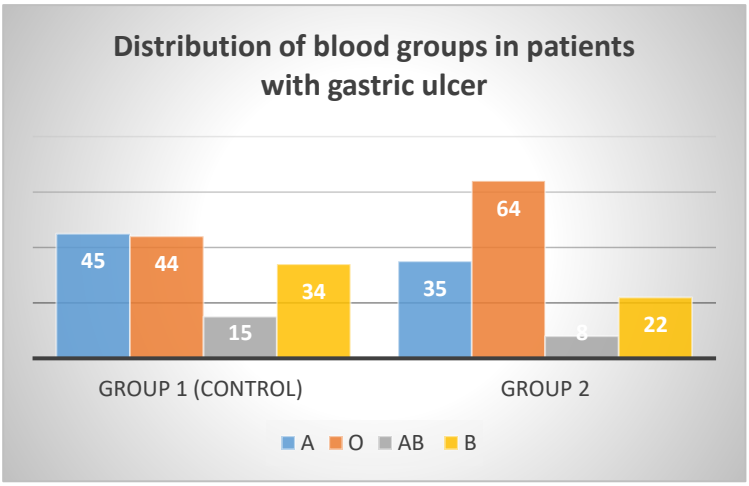
Methods

This study included a total of 267 patients who underwent endoscopy to detect gastric ulcer. Out of 267 patients, 138 were healthy (Group 1: control group), while 129 had gastric ulcer (Group 2). Blood samples were collected from all patients. Blood samples were analysed for serum gastrin and plasma leptin.

Pedia Companion

Volume 3 | Issue 13 | 2024

Results



This study results showed that there was an association between ABO blood groups and gastric ulcer. Type "O" was more likely to develop stomach ulcer disease, whereas type "AB" was less prone. The blood group O had the greatest positive infection result (59.3%), whereas the blood group AB had the lowest result (34.8%). P-value <0.05 indicated statistically significant results for the blood types to be taken into consideration as risk factors. In comparison to the control group, there was a significant increase in serum gastrin in group 2. On the other hand, in group 2, there was a significant decrease in serum leptin on comparison with the control group.

Discussion

The findings of the study showed that there was an association between gastric ulcer and the "ABO" blood types, with type "O" showing a greater tendency for disease and type "AB" showing no symptoms.[1] The findings of Chatila et al. supported the epidemiological theory that blood group "O" was more susceptible to gastric ulcers than blood group "AB" which was less susceptible.[3] Individuals with the blood group type O were more likely to develop specific diseases including ulcers or thyroid disorders. It has been demonstrated that these individuals have a 2-times higher risk of developing various types of ulcers compared to those from different blood groups.[4]

Conclusion

This study demonstrated that there was an association between the 'ABO' blood groups and gastric ulcer, in which type 'O' had a higher tendency towards gastric ulcer disease and type 'AB' to less affected**.**

References

1. Abdulkareem GK. Determination the Association between ABO Blood Group and Gastric Ulcer. American Journal of Pediatric Medicine and Health Sciences (2993-2149). 2023 Dec 6;1(10):43-5.
2. Teshome Y, Mekonen W, Birhanu Y, Sisay T. The association between ABO blood group distribution and peptic ulcer disease: a cross-sectional study from Ethiopia. Journal of blood medicine. 2019 Jul 4:193-7.
3. Chatila AT, Bilal M, Guturu P. Evaluation and management of acute pancreatitis. World J Clin Cases. 2019 May 06;7(9):1006-1020.
4. Narayanan M, Reddy KM, Marsicano E. Peptic Ulcer Disease and Helicobacter pylori infection. Mo Med. 2018 May-Jun;115(3):219-224.

Pedia Companion

Volume 3 | Issue 13 | 2024

Case report on bilateral phyllodes tumour

Introduction

Nipple-sparing mastectomy was the treatment option for bilateral phyllodes tumor

Phyllodes tumors (PT) are rare neoplasms which represent less than 1% of all primary breast tumors, that occurs mainly in older women. Clinically, these tumors were characterized by their rapid growth and arise from fibroepithelial tissue. Phyllodes tumors appear as a palpable mass that was expanding rapidly.[1] WHO guidelines classified tumor into benign, borderline or malignant. Benign tumor was the most common grade of phyllodes tumor occurring between 60% and 75% of the cases.[2] This report described a case of 15 years old female patient with Autism-Spectrum Disorder, biopsy showing fibroadenoma and final pathology remarkable for bilateral phyllodes tumor.

Case presentation

A 15-year-old female with medical history of Autism Spectrum Disorder (ASD) was evaluated for the bilateral breast masses. Core-needle aspiration biopsy of bilateral lesions showed fibroadenomas. Later the patient presented with ulceration and bleeding from the left breast mass (Figure 1). On physical examination, ulcerated mass measured more than 10 cm. Due to this above condition patient was scheduled for an urgent left nipple-sparing mastectomy (Figure 2). A multifocal, aggressive type phyllodes tumor with moderate stromal cellularity, moderate stromal atypia, high mitotic index was revealed by the pathology, and this tumor was identified as a borderline phyllodes tumor. Patient was scheduled for right breast resection due to the history of a rapidly growing ulcerated mass and the existence of a lump in her right breast with a similar preoperative biopsy. The pathological diagnosis of her right breast revealed multifocal borderline phyllodes tumors with moderate stromal cellularity and stromal atypia, high mitotic index, and one involved margin. Postoperative course was unremarkable and tumor board recommended ultrasound every 3 to 6 months and serial physical examination.

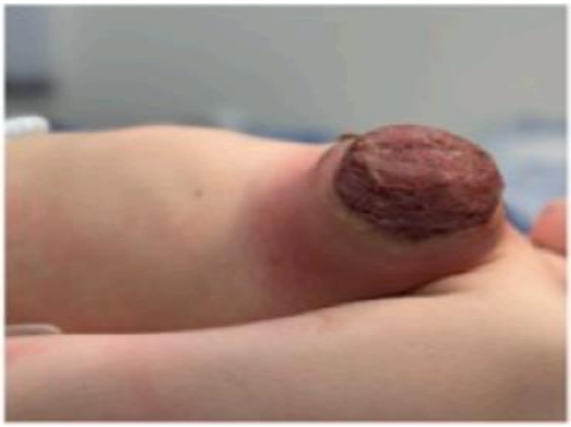


Figure 1. Left breast with ulcerated mass

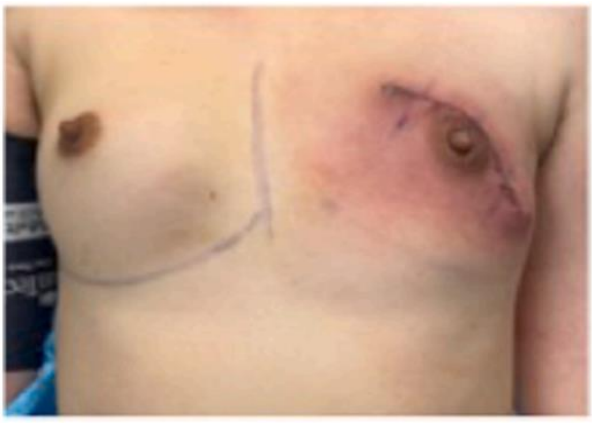


Figure 2. Left nipple-sparing mastectomy

Discussion

Tumors are often unilateral and can develop in any area of the breast, including the nipple and ectopic breast tissue. Treatment options for fibroepithelial lesions of the breast, such as fibroadenomas and PT, varies significantly. After a core-needle biopsy, patient revealed fibroadenomas; however, the final pathology showed borderline PT. The preoperative workup finds it simpler to identify this subtype because the cytological diagnosis of a malignant PT was characterised by stromal cellularity, atypia and overgrowth, as well as infiltrative nature. A broad local excision with a 1 cm margin was often considered to be sufficient for benign phyllodes tumors. This was not an easy decision to do a bilateral mastectomy on this patient, however, they selected this particular plan of action due to the aggressiveness of patient's tumors and the high chance of recurrence.[1] Similar case report showed benign phyllodes tumor in which the treatment option was right total mastectomy and the study stated mastectomy was the standard of care for giant benign phyllodes tumors.[3]

Conclusion

This case report described a pediatric patient who presented with an aggressive type of bilateral phyllodes tumor. Based on the history of rapid growth and ulceration, early surgical mastectomy was done and postoperative period was uneventful.

Reference

1. Mayorga-Pérez I, Mulero-Soto P, De La Rosa KC, Negrón-González V, Hernandez-Rosa J, Feneque-Gonzalez J, Correa-Rivas M, Abdul-Hadi A. Bilateral phyllodes tumor: Case report. Journal of Pediatric Surgery Case Reports. 2023 Dec 8:102753.
2. Ditsatham C, Chongruksut W. Phyllodes tumor of the breast: diagnosis, management and outcome during a 10-year experience. Cancer management and research. 2019 Aug 19:7805-11.
3. Fernández-Ferreira R, Arroyave-Ramírez A, Motola-Kuba D, Alvarado-Luna G, Mackinney-Novelo I, Segura-Rivera R. Giant benign mammary phyllodes tumor: report of a case and review of the literature. Case Reports in Oncology. 2021 May 3;14(1):123-33.

MICRO KNOWLEDGE ACADEMY

This scientific input is prepared from the Department of Medical Services, an initiative of M/s Micro Labs Limited under the aegis of Micro Knowledge Academy. The information contained herein is for education purpose only. The content is developed by compiling information from various authentic and published literatures. Although great care has been taken to assure the accuracy of the publication, M/s Micro Labs Limited shall not be responsible or in any way liable for any inaccuracy, errors, or omissions resulting from negligence or otherwise howsoever or any consequences arising there from. In spite of best efforts, the information in this publication may become outdated over time. M/s Micro Labs Limited shall not be responsible in any manner whatsoever, for any action taken, opinions expressed, advice rendered or accepted, any direct, incidental, special or consequential loss and damage caused on the basis of any material or information presented in this publication / update.