All autosomal variants were filtered for allelic frequency <1% according to the gnomAD database (version 2.1). Among them, 821 variants were found the most common ($\geq 10\%$) in both the control and experimental group. Wherein 280 variants were presented with an alternative allele frequency of more than 10% in the experimental group, but were found with a lower frequency in the control. Interestingly, 10 of these 280 variants were located in the ZNF717 gene. This gene encodes a Kruppel-associated box (KRAB) zinc-finger protein, which belongs to a large group of transcriptional regulators in mammals and play important roles in various cellular functions, including cell proliferation, differentiation and apoptosis. Extended bioinformatics analysis showed that 34 unique variants were found in the experimental group and were absent in the control group, which may indicate both the characteristics of Russian children with BPD and the insufficient representativeness of the control group and, in turn, requires a more in-depth analysis.

For the first time in Russia, large-scale studies have been carried out to identify the molecular genetic characteristics of Russian children with BPD using full exome sequencing. Our study indicates ZNF717 gene may be relevant in BPD pathogenesis, but further research is required. These preliminary results may contribute to improving knowledge of the pathogenesis of bronchopulmonary dysplasia and targeting therapeutic interventions.

424 WHAT IS BEHIND A SPONTANEOUS PNEUMOTHORAX?

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Introduction/Description Secondary Spontaneous Pneumothorax has its peak incidence in adulthood, occurring as a complication of an underlying lung disease, with variable symptoms at presentation.

A 15-year-old female previously healthy was admitted to the Emergency Department complaining of chest pain on left hemithorax and dyspnoea lasting for 24 hours, associated with a non-productive cough for 1 week. She denied fever, rhinorrhea, trauma, foreign body aspiration, inhalation of drugs, consumption of tobacco or any medication. She had no relevant family history. On admission, she was eupneic, SpO₂ 99% (FiO₂ 21%) and an absence of vesicular murmur was noted on the left hemithorax. Chest radiography revealed a left side pneumothorax with no mediastinal deviation.

Supplemental oxygen was initiated by a nonrebreathing facemask and the patient was advice to rest. The lack of improvement motivated a pneumothorax drainage by needle aspiration with an initial favourable response. However, 24 hours later a recurrence of the pneumothorax was noted in the control radiography. Chest-CT confirmed this finding and depicted an atelectasis of the left lower lobe, with a slight right deviation of the upper mediastinum and left apical pulmonary cystic features, suggestive of Congenital Cystic Adenomatoid Malformation (CCAM) of the lung. Subsequently, surgical removal of the left upper lobe was performed and CCAM type II was confirmed by histopathology.

Conclusion Although primary spontaneous pneumothorax in adolescents is the most common subtype, in cases where the

course of the disease is not as expected, a secondary cause should be considered.

Even though CCAM is considered a rare disorder, it is the most common congenital pulmonary malformation with an incidence of 1:8300 to 35.000 live-births. CCAM occurs mostly sporadically and in about 1/3 of the cases the diagnosis is made after the neonatal period. In the presence of pneumothorax, CCAM type IV should be considered and deserves special attention due to its malignant potential. In symptomatic cases, the therapeutic measures consist in pulmonary resection of the affected areas, which is curative and has few complications.

425 A CASE OF A 13-YEAR-OLD BOY WITH PARAPNEUMONIC EFFUSION CAUSED BY STREPTOCOCCUS CONSTELLATUS

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A 13-year-old previously healthy male presented with a two-week history of intermittent fever and left subcostal pain, which had previously been attributed to viral gastroenteritis. He was tachypnoeic, in need of supplemental oxygen, and on examination there was no air entry on the left side of the chest. Laboratory findings included leucocytosis (WBC 27000/ μ l with a left shift) and high levels of inflammatory markers (CRP>300 mg/L).

Chest X-ray revealed complete whiteout of the left lung and subsequent ultrasound showed a large loculated pleural effusion. CT chest confirmed the findings and showed the extent of the infection and effusion. The patient was taken to theatre where a chest drain was inserted, automatically draining approximately 500ml of pus-like fluid, which was sent for cell count, microscopy, and cultures.

The patient was started on broad-spectrum intravenous antibiotics and received intrapleural fibrinolysis treatment with alteplase. His PCR and antibodies for SARS-CoV2 were negative. The pleural fluid analysis confirmed an exudate, and molecular methods as well as pleural fluid cultures indicated *Streptococcus constellatus* as a cause for his pneumonia and subsequent complicated parapneumonic effusion. Sputum cultures and blood cultures were negative.

Despite optimal antibiotic treatment with cefotaxime and teicoplanin based on sensitivities, there was little clinical and radiological improvement over the next few days, therefore the decision was made for the patient to return to theatre for decortication of the left lung and thoracostomy.

Following this steady progress was made and the patient was able to mobilize and benefit from physiotherapy to help expand the left lung.

Inflammatory markers returned to normal, and imaging showed marked improvement. The patient completed a total of 3 weeks of intravenous antibiotics. The chest drain was removed on day 18 of his hospital stay after having drained a total of over 1500ml of fluid.

Prior to discharge, as the streptococcus species isolated was not considered typical of the patient's age group and course of illness further tests were sent. *Streptococcus constellatus* is a group F beta streptococcus species, known to cause high

morbidity in adults however is not often reported in cases of empyema in paediatric populations. Associations include cystic fibrosis, malignancies, alcohol consumption and male gender.

Immunoglobulin levels and sweat test were normal for this patient, and there were no malignant cells in the microscopy report.

He was discharged in excellent condition. He remains under follow up with our team.

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A SYSTEMATIC REVIEW OF CLINICAL PREDICTION RULES TO DIAGNOSE BACTERIAL LOWER RESPIRATORY INFECTION IN CHILDREN IN PRIMARY CARE AND THEIR VALIDATION IN A NEW COHORT

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Pneumonia is the greatest single cause of paediatric mortality.¹ Children are perceived as a vulnerable population and it is well established that primary-care clinicians have a tendency to overprescribe antimicrobials, despite a low level of clinical suspicion for the presence of a bacterial respiratory infection.^{2,3} Clinical prediction rules (CPR) combine variables derived from the history, examination and basic investigations to guide clinicians with a probability of a target diagnosis.⁴ Used correctly, CPRs can serve to reassure clinicians in their decision to avoid therapeutic intervention, adopting a 'watch-and-wait' approach.⁵

This aim of this study was to identify existing clinical prediction rules for hospitalisation due to bacterial lower respiratory tract infection in children in primary care, with the aim to guide antibiotic therapy and to undertake validation of these rules in a novel cohort of children presenting to primary care in Malawi with World Health Organisation clinically defined pneumonia.

OVID MEDLINE & EMBASE databases were searched for studies on the development, validation and clinical impact of clinical prediction models for bacterial LRTI in children between 1946 & Q2-2021. Two reviewers screened all titles and abstracts independently. The study was conducted in accordance with the PRISMA guidelines.⁶

The BIOTOPE cohort (BIOMarkers TO diagnose PnEumonia) recruited children aged 2-59 months with WHO defined pneumonia from two primary care facilities in Mzuzu, Malawi.⁷ Validation of STARWAVE in BIOTOPE employed derivation and internal validation using bootstrapping.

1023 abstracts were identified and following the removal of duplicates, a review of 989 abstracts was conducted leading to the identification of one eligible model – the STARWAVE rule.⁸ Validation of the STARWAVE rule was undertaken in the BIOTOPE cohort which consisted of 494 children with WHO clinically defined pneumonia presenting to primary care in Malawi. The area under the curve (AUC) of the STARWAVE rule for hospitalisation in BIOTOPE was found to be 0.8 (95% C.I 0.75-0.85). However, the AUC of STARWAVE for a confirmed diagnosis of bacterial pneumonia was 0.39 (95% C.I 0.25-0.54).

Clinical prediction rules could facilitate the advancement of antimicrobial stewardship in the area of paediatric pneumonia.

STARWAVE was accurate for predicting hospitalisation, but not bacterial infection. In the absence of a gold-standard indicator for bacterial LRTI, this is a reasonable surrogate and could lead to significant reductions in antibiotic prescription rates. Further work to determine its clinical impact is required.

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IDIOPATHIC CHRONIC EOSINOPHILIC PNEUMONIA: A PAEDIATRIC CASE REPORT

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Introduction Rare pulmonary diseases in childhood continue to be a significant problem in clinical practice because there is a lack of diagnostic and therapeutic guidelines based on reliable scientific evidences. This group of diseases includes idiopathic eosinophilic pneumonias (IEP) that can manifest as acute or chronic or as transient Löffler syndrome. A paediatric case of chronic IEP was reported.

Case Report A 15-year old adolescent was referred to paediatric pulmonologist for suspected asthma. He complained of episodes of shortness of breath and wheezing for a year. Symptoms were more pronounced at night and were also effort induced. The symptoms showed a progressive trend. The boy did not lose weight and had no fever nor night sweats. He denied smoking cigarettes.

Lung function was severely impaired (FVC 61% FEV1 47%) with negative reversibility test. Inflammatory reactants were slightly elevated (ESR 28; CRP 11.1). Severe eosinophilia ($3.36 \times 10^9/L$) of peripheral blood was recorded. Chest CT demonstrated extensive bilateral ground-glass opacifications and peripheral airspace consolidations. Bronchoscopy revealed diffuse redness of tracheobronchial mucosa with severe BAL eosinophilia (eos 75%). In spite to high total blood IgE level of 1265 kIU/L, results of allergic and extensive microbiological