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IAP - IJPP CME - 2024

RATIONAL USE OF ANTIBIOTICS IN NEONATAL INTENSIVE CARE UNITS

***Giridhar Sethuraman**
****Monisha Rameshbabu**

Abstract: *Antibiotics are among the most frequently prescribed medications in neonatal intensive care units, often serving as lifesaving interventions in the context of suspected or confirmed sepsis. However, their overuse contributes to serious adverse outcomes such as antimicrobial resistance, disruption of the neonatal microbiome, increased incidence of necrotizing enterocolitis, invasive fungal infections and even mortality. Neonates pose unique challenges for antibiotic therapy due to diagnostic uncertainty, immature organ function affecting pharmacokinetics, and variability in clinical practice. This article outlines a rational framework for antibiotic use in neonates-emphasizing the selection of the right patient, appropriate antibiotic, route, dosage and treatment duration. It discusses the nuances of empirical therapy, the role of biomarkers and organism-specific considerations. The article further highlights antimicrobial stewardship strategies tailored to specific institutions, including prescription audits, formulary restrictions, selective susceptibility reporting, and de-escalation protocols. Adopting these measures is essential for optimizing therapeutic outcomes, minimizing harm and curbing the growing threat of antimicrobial resistance in neonatal care.*

Keywords: *Antimicrobial stewardship, Infant, Newborn.*

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Points to Remember

- ***Antibiotics are among the most frequently prescribed medications in neonatal intensive care units, often serving as lifesaving interventions.***
- ***Rational frame work for antibiotic use in neonates is challenging and one size fits all is a myth.***
- ***Antibiotic stewardship strategies are always tailored to every NICU and they have to be adhered to strictly.***
- ***Use of unit specific antimicrobial policies are the most useful one and it differs from region to region.***
- ***Use of computerized physician order entry (CPOE) systems will help and aid clinical decision making.***

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IAP - IJPP CME - 2024

POST ASPHYXIAL MANAGEMENT IN LEVEL I AND II NEONATAL INTENSIVE CARE UNITS

***Prakash V**
****Elayarani Elavarasan**

Abstract: *Perinatal asphyxia remains a major challenge in developing countries, contributing significantly to neonatal morbidity and mortality. Level I and level II neonatal care units often serve as the first point of contact for affected newborns. It is essential that these units are equipped appropriately with gadgets and personnel to promptly recognize the signs of hypoxic ischemic encephalopathy, stabilize affected neonates and facilitate timely referral to higher centers when necessary. This article focuses on the clinical presentation of neonatal encephalopathy, interventions available and the immediate management protocols for hypoxic-ischemic injury.*

Keywords: *Perinatal asphyxia, Therapeutic hypothermia, Neonatal seizures.*

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Points to Remember

- ***Cord arterial blood gas or any blood gas should be undertaken within one hour of birth in cases of suspected perinatal asphyxia to enable early identification of babies with hypoxic ischemic encephalopathy.***
- ***Neonatal units providing only Level I or II care should avoid using uncontrolled or unmonitored cooling methods, as therapeutic hypothermia requires specialized equipment and trained personnel available in tertiary centers.***
- ***Early referral within 4 hours of birth to a tertiary care centre with facilities for therapeutic hypothermia is advised if baby has moderate or severe asphyxia, ensuring initiation of cooling therapy within the critical 6-hour window.***
- ***In neonates with mild encephalopathy or with suspected perinatal asphyxia, periodic assessment using modified Sarnat and Sarnat staging should be done to monitor progression to moderate encephalopathy.***

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SCARLET FEVER

***Balasubramanian S**
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Abstract: *Scarlet fever is an acute infectious disease caused by toxigenic strains of Streptococcus pyogenes (Group A Streptococcus) characterized by fever, pharyngitis, a sandpaper-like rash and "strawberry tongue." Historically associated with high morbidity and mortality, scarlet fever is now effectively managed with antibiotics, notably penicillin V or amoxicillin. Recent outbreaks with atypical seasonality and increased mortality highlight the need for continued awareness and surveillance. Diagnosis is primarily clinical, supported by laboratory tests such as rapid antigen detection and throat culture. Management includes prompt antibiotic therapy to reduce transmission and prevent complications, which may be suppurative or immune-mediated. Prevention focuses on early treatment, respiratory hygiene and outbreak control in community settings.*

Keywords: *Scarlet fever, Streptococcus pyogenes, Pharyngitis, Rash, Antibiotic therapy, Rapid antigen detection test.*

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Points to Remember

- ***Scarlet fever presents with fever, sore throat, a characteristic scarlatiniform rash, and strawberry tongue.***
- ***Diagnosis is clinical but can be supported by rapid antigen detection tests and throat cultures.***
- ***Molecular PCR assays offer high sensitivity but are not universally available.***
- ***Oral penicillin V is the first-line therapy; amoxicillin is preferred in regions where penicillin V is not readily available.***
- ***Alternatives exist for penicillin-allergic patients but resistance to macrolides should also be kept in mind.***
- ***Complications can be suppurative (e.g., otitis media, abscesses) or nonsuppurative/immune-mediated (e.g., acute rheumatic fever, post-streptococcal glomerulonephritis).***
- ***Prompt treatment is the key.***

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PEDIATRIC SEPTIC SHOCK - REVISITING KEY UPDATES

***Lakshmi Prashanth**

Abstract: *Septic shock, a subset of sepsis is characterized by profound circulatory and metabolic abnormalities. The pathophysiology involves complex interactions between the host immune response and pathogens, leading to endothelial dysfunction, vasoplegia, relative hypovolemia and myocardial depression. Management strategies include fluid resuscitation, vasopressor support and early antibiotic therapy. Recent years have seen significant updates in the definition, recognition and management of pediatric septic shock. Current emphasis is on early recognition, fluid-sparing resuscitation strategies, early institution of norepinephrine and individualized care (rather than a "one-glove-fits-all" approach). The Phoenix sepsis score, a novel score that identifies life threatening organ dysfunction, is a promising tool for risk stratification.*

Keywords: *Septic shock, Vasoplegia, Myocardial dysfunction, Fluid resuscitation, Vasoactives, Nor-epinephrine, Phoenix sepsis score.*

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Points to Remember

- ***Septic shock in children is a complex syndrome involving relative hypovolemia, vasoplegia and myocardial dysfunction.***
- ***Early recognition using clinical markers and age-specific vital signs is essential.***
- ***The three pillars of hemodynamic support are fluids, vasopressors and inotropes.***
- ***Management has shifted from aggressive fluid resuscitation to restrictive, individualized fluid therapy combined with early vasoactive support, primarily norepinephrine.***
- ***Resuscitation endpoints include adequate cardiac output, MAP/DBP for organ perfusion and avoidance of congestion.***
- ***The Phoenix Sepsis Score offers a practical tool for risk stratification.***

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TIMING OF INTERVENTIONS IN COMMON CONGENITAL HEART DEFECTS

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Abstract: *Congenital heart defects are the most common amongst birth anomalies. Timely intervention can prevent complications and reduce the mortality associated with these defects. This article discusses the timing of intervention for common congenital heart defects and is largely based on the Indian guidelines proposed by the working group on the management of congenital heart diseases.*

Keywords: *Congenital heart defects, Timing of intervention, Surgery, Device closure.*

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Points to Remember

- ***Early diagnosis and timely intervention improve survival and quality of life in children with congenital heart defects.***
- ***Weight of the child is not a criterion to plan the timing of intervention.***
- ***Spontaneous closure is not seen in large left to right shunts.***
- ***There is no role for pharmacological closure (ibuprofen/indomethacin) in term neonates with PDA.***

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VERY EARLY ONSET INFLAMMATORY BOWEL DISEASE IN CHILDREN

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Abstract: *Very early onset inflammatory bowel disease, defined as inflammatory bowel disease with onset before 6 years of age, represents a distinct and increasingly recognized subset of pediatric inflammatory bowel disease. While sharing some phenotypic similarities with later-onset disease, very early onset inflammatory bowel disease often presents with unique challenges in diagnosis, pathogenesis, and management. This review aims to provide an overview of the current understanding of very early onset inflammatory bowel disease, highlighting its clinical characteristics, underlying myriad genetic etiologies, diagnostic approaches and therapeutic strategies.*

Keywords: *Very early onset inflammatory bowel disease, Children, Genetics, Biologicals.*

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Points to Remember

- ***Very early onset inflammatory disease (VEO-IBD) occurs in children younger than 6 years old.***
- ***The causes of VEO-IBD can be varied and may involve a combination of genetics, the immune system and environmental factors. In some cases, there may be an underlying monogenic etiology or primary immune deficiency. Genetic testing is important for diagnosis.***
- ***Early detection is crucial to ensure children receive timely treatment to manage inflammation, promote healthy growth and development and prevent complications.***
- ***Children with IBD may experience extra-intestinal manifestations such as joint pain, eye inflammation, skin problems and mouth ulcers. In VEO-IBD, monitoring for growth failure and delayed puberty is particularly important.***
- ***Psychological support is an important aspect of care, as children with VEO-IBD and their families may face challenges in coping with a chronic illness, managing medications and navigating school and social activities.***

PS : All standard abbreviations of gene related locations and receptors are left as such for the users to refer to text books.

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RATIONAL ANTI-SEIZURE MEDICATION TREATMENT

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Abstract: *Pediatricians and neurologists often face challenges when managing children with epilepsy, including issues such as delayed initiation of treatment, medication non-adherence, social stigma, drug resistance and adverse effects related to treatment. Additionally, behavioral and cognitive co-morbidities are common in children with epilepsy. Understanding different types of epilepsy, and selecting appropriate medications tailored to each type is crucial for effective management. A systematic approach that includes understanding the unique characteristics of each patient's epilepsy, maintaining open communication, ensuring close follow-up, and timely referral to specialist care can help address these challenges effectively.*

Keywords: *Drug-resistant epilepsy, Childhood epilepsy, Antiseizure medication, Polytherapy.*

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Points to Remember

- ***A "one-size-fits-all" approach is ineffective in treating epilepsy; treatment should be individualized.***
- ***Treatment should focus on the patient's clinical condition, not just EEG or MRI reports.***
- ***Accurately identifying the seizure and epilepsy type is essential for selecting the appropriate first-line anti-seizure medication.***
- ***Polytherapy is considered only when monotherapy options have been fully exhausted.***
- ***A systematic approach to treatment yields better outcomes in epilepsy management.***

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DRUG PROFILE

PLASMA-DERIVED THERAPEUTIC PROTEINS IN PEDIATRICS - PART II

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Abstract: *Part II of the deliberations on PDTP therapies will deal with issues related to the less commonly used products including thrombin for local hemostasis, Von Willebrand factor for treatment of Von Willebrand disease and antithrombin for acquired antithrombin deficiency associated with major cardiac surgery, also, alpha-1 antitrypsin for alpha-1 antitrypsin deficiency, C1 esterase inhibitor concentrate for hereditary angioedema or C1 esterase deficiency and fibrinogen concentrate for the management of congenital fibrinogen deficiency.*

Keywords: *Thrombin, Von Willebrand factor, Antithrombin, Alpha-1 antitrypsin, C1 esterase inhibitor concentrate, Fibrinogen concentrate.*

Points to remember

- ***Plasma-derived therapies, including those for rare diseases, are being used in clinical practice and pediatricians need to be updated.***
- ***With advances in Recombinant DNA technology, plasma-derived products remain vital and play a significant role in improving patient outcomes.***
- ***Emphasis must be made to ensure that these therapies are available, despite challenges in supply.***
- ***Continuous research and development is required to explore new fractionation processes and improve quality control measures.***
- ***To enhance effectiveness of PDTPs.***
- ***Population suffering from rare coagulation disorders with PDTP / rare orphan diseases, have treatment options however limited in supply.***

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CASE REPORT

ROWELL SYNDROME WITH BASAL GANGLIA CALCIFICATION IN A CHILD WITH NEUROPSYCHIATRIC SYSTEMIC LUPUS ERYTHEMATOSUS

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Abstract: *In patients diagnosed with systemic lupus erythematosus, any acute neurological symptom, even subtle, warrants thorough evaluation for neuropsychiatric systemic lupus erythematosus. Immunosuppressive therapy can be life-saving in cases of lupus with severe systemic symptoms. Features such as early age of onset/presentation, history of consanguinity in parents, negative anti-ds DNA antibody status and predominant neurological manifestations should prompt suspicion of complement deficiency-associated systemic lupus erythematosus.*

Here, we report a complex case of an eight-year-old girl presenting with cutaneous manifestations consistent with Rowell syndrome, progressive neuropsychiatric involvement refractory to initial therapy, and imaging findings of basal ganglia calcifications, highlighting the diagnostic and therapeutic challenges encountered. This case underscores the importance of early aggressive immunosuppression and consideration of complement deficiency in pediatric lupus with prominent neurological symptoms.

Keywords: *Systemic Lupus erythematosus, Erythema multiforme, Basal ganglia calcification.*

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