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- Advanced Neonatal & Paediatric intensive care services including neonatal & paediatric ECMO.
- Advanced Paediatric Cardiology Services including minimal invasive surgeries & complex interventional procedures.
- Advanced paediatric gastroenterology & hepatology services including advanced ERCP.
- Advanced paediatric surgical services including all laparoscopy surgeries.
- Advanced paediatric nephrology services including Renal replacement therapy(RRT).
- Advanced fetal & maternal medicine services including advanced ultrasound & fetal ECHO.
- Teaching institute with DNB(Paediatrics), fellowships & MRCPCH (UK) courses.

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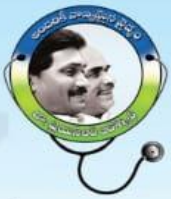

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Foreword

Greetings from the Andhra Hospitals!

For the past two decades, we are delivering excellence in terms of quality health care in the field of Paediatrics including Paediatric and Neonatal intensive care, Paediatric cardiac intensive care and other allied Paediatric sub-specialities.We take pride in introducing ECMO in pediatric specialty for the first time in the state of Andhra Pradesh. In this context, we convey our heartfelt thanks to you for your continued support and encouragement which played a pivotal role in our success.

As a token of our commitment to contribute to continuous medical education, we are introducing this monthly E-journal to showcase important clinical guidelines, recent advances in paediatric sub-specialties, interesting case reports, image quiz, OSCE scenarios etc, gathered from our patient database. We hope this endeavor would prove to be useful to practicing paediatricians, intensivists, neonatologists and post-graduate students.

Please send your valuable feedback and suggestions to ***maramkp@gmail.com*****.**

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Surviving Sepsis Guidelines for the Management of Septic Shock in Children-2020

Summary of Important Recommendations

SCREENING, DIAGNOSIS, AND SYSTEMATIC MANAGEMENT OF SEPSIS

Recommended to implementing a protocol/guideline for management of children with septic shock or other sepsis-associated organ dysfunction

Obtain blood cultures before initiating antimicrobial therapy in situations where this does not substantially delay antimicrobial administration

ANTI-MICROBIAL THERAPY

In children with septic shock, start antimicrobial therapy as soon as possible, within 1 hr of recognition.

In children with sepsis-associated organ dysfunction but without shock, start antimicrobial therapy as soon as possible after appropriate evaluation, within 3 hr of recognition

Once the pathogen(s) and sensitivities are available, narrow empiric antimicrobial therapy coverage

Remove intravascular access devices that are confirmed to be the source of sepsis or septic shock after other vascular access has been established and depending on the pathogen and the risks/benefits of a surgical procedure

FLUID THERAPY

Administer up to 40–60 mL/kg in bolus fluid (10–20 mL/kg per bolus) over the first hour, titrated to clinical markers of cardiac output and discontinued if signs of fluid overload develop, for the initial resuscitation of children with septic shock or other sepsis-associated organ dysfunction

in the absence of hypotension, recommendation against bolus fluid administration while starting maintenance fluids

Use crystalloids, rather than albumin, for the initial resuscitation of children with septic shock or other sepsis associated organ dysfunction

Use balanced/buffered crystalloids, rather than 0.9% saline, for the initial resuscitation of children with septic shock or other sepsis-associated organ dysfunction

Recommendation against using starches and Gelatin in the acute resuscitation of children with septic shock or other sepsis-associated organ Dysfunction

HEMODYNAMIC MONITORING

Use trends in blood lactate levels, in addition to clinical assessment, to guide resuscitation of children with septic shock and other sepsis-associated organ dysfunction
Suggested not using bedside clinical signs in isolation to categorize septic shock in children as “warm” or “cold”

Use advanced hemodynamic variables (include cardiac output/cardiac index, systemic vascular resistance, or central venous oxygen saturation), when available, in addition to bedside clinical variables to guide the resuscitation of children with septic shock or other sepsis-associated organ dysfunction.

VASOATCIVE MEDICATIONS

Use epinephrine, rather than dopamine, in children with septic shock.

Use norepinephrine, rather than dopamine, in children with septic shock

It is reasonable to begin vasoactive infusions after 40–60 mL/kg of fluid resuscitation if the patient continues to have evidence of abnormal perfusion. Either epinephrine or norepinephrine may be administered through a peripheral vein (or intraosseous, if in place) if central venous access is not readily accessible.

Dopamine may be substituted as the first-line vasoactive infusion, administered either peripherally or centrally, if epinephrine or norepinephrine is not readily available.

Add vasopressin or further titrate catecholamines in children with septic shock who require high-dose Catecholamines

VENTILATION

Trial of noninvasive mechanical ventilation (over invasive mechanical ventilation) in children with sepsis-induced PARDS without a clear indication for intubation and who are responding to initial resuscitation
Use high PEEP in children with sepsis-induced PARDS

Trial of prone positioning in children with sepsis and severe PARDS

Use iNO as a rescue therapy rather than as a routine in children with sepsis-induced PARDS and refractory hypoxemia after other oxygenation strategies have been optimized

No recommendation to use high-frequency oscillatory ventilation vs conventional ventilation in children with sepsis-induced PARDS.

Use neuromuscular blockade in children with sepsis and severe PARDS

CORTICOSTEROIDS

Suggestion against using IV hydrocortisone to treat children with septic shock if adequate fluid resuscitation and vasopressor therapy are able to restore hemodynamic stability

Either IV hydrocortisone or no hydrocortisone may be used if adequate fluid resuscitation and vasopressor therapy are not able to restore hemodynamic stability

ENDOCRINE AND METABOLIC

Recommendation against insulin therapy to maintain glucose target at or below 140 mg/dL

Suggestion against the routine use of levothyroxine in children with septic shock and other sepsis-associated organ dysfunction in a sick euthyroid state

Use either antipyretic therapy or a permissive approach to fever in childrenwith septic shock or other sepsis-associated organ dysfunction

NUTRITION

No recommendation regarding early hypocaloric/trophic enteral feeding followed by slow increase to full enteral feeding vs early full enteral feeding in children with septic shock or sepsis-associated organ dysfunction without contraindications to enteral feeding.

Enteral feeding is not contraindicated in children with septic shock after adequate hemodynamic resuscitation who no longer require escalating doses of vasoactive agents or in whom weaning of vasoactive agents has started.

Use enteral nutrition as the preferred method of feeding and that parenteral nutrition may be withheld in the first 7 d of PICU admission in children with septic shock or other sepsis-associated organ dysfunction

suggestion against the routine measurements of gastric residual volumes in children with septic shock or other sepsis associated organ dysfunction

Administering enteral feeds through a gastric tube, rather than a post-pyloric feeding tube, to children with septic shock or other sepsis-associated organ dysfunction who have no contraindications to enteral feeding

Suggestion against the routine use of prokinetic agents for the treatment of feeding intolerance in children with septic shock or other sepsis-associated organ dysfunction

Suggestion against the use of selenium, glutamine supplementation,arginine,zinc supplementation, Vitamin C , Thiamine and Vitamin –D supplementation in children with septic shock or other sepsis-associated organ dysfunction

BLOOD PRODUCTS

Suggestion against transfusion of RBCs if the blood hemoglobin concentration is ≥ 7 g/dL in hemodynamically stabilized children with septic shock or other sepsis-associated organ dysfunction

Suggestion against prophylactic platelet transfusion based solely on platelet levels in non bleeding children with septic shock or other sepsis-associated organ dysfunction and thrombocytopenia

Suggestion against prophylactic plasma transfusion in non-bleeding children with septic shock or other sepsis-associated organ dysfunction and coagulation abnormalities

PLASMA EXCHANGE, RENAL REPLACEMENT, AND EXTRACORPOREAL SUPPORT

Suggestion against using plasma exchange in children with septic shock or other sepsis-associated organ dysfunction without TAMOF

Use renal replacement therapy to prevent or treat fluid overload in children with septic shock or other sepsis associated organ dysfunction who are unresponsive to fluid restriction and diuretic therapy

Suggestion against high-volume hemofiltration over standard hemofiltration in children with septic shock or other sepsisassociated organ dysfunction who are treated with renal replacement therapy

Suggestion to use venovenous ECMO in children with sepsis-induced PARDS and refractory hypoxia
Suggestion to use venoarterial ECMO as a rescue therapy in children with septic shock only if refractory to all other treatments

IMMUNOGLOBULINS

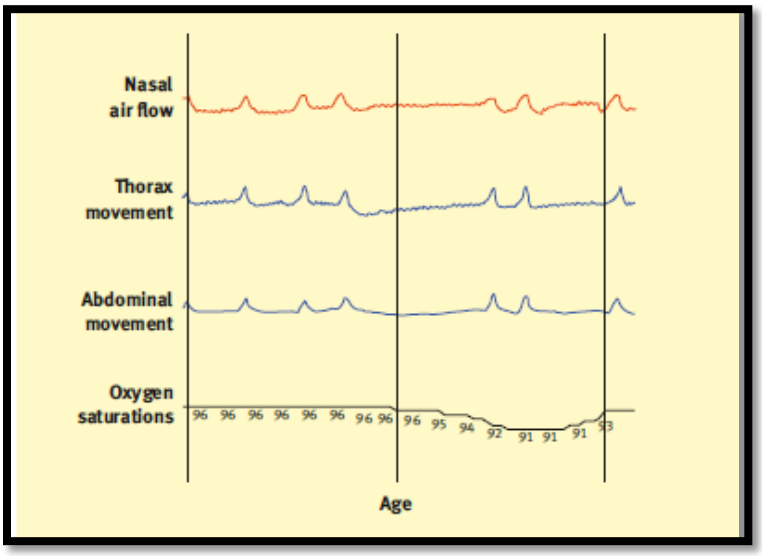
Suggestion against the routine use of IVIG in children with septic shock or other sepsis-associated organ dysfunction . Although routine use of IVIG is not recommended, select patients may benefit from such treatment.

PROPHYLAXIS

Suggestion against the routine use of stress ulcer prophylaxis in critically ill children with septic shock or other sepsisassociated organ dysfunction, except for high-risk patients

Suggestion against routine deep vein thrombosis prophylaxis (mechanical or pharmacologic) in critically ill children with septic shock or other sepsis-associated organ dysfunction, but potential benefits may outweigh risks and costs in specific populations

A 5-day-old term infant presents with a history of multiple apnoeic episodes during which she was noted by her parents to have blue lips and appeared not to be breathing. On examination, the infant was alert, afebrile and not dysmorphic; heartsounds were normal at 110/min. The chest was clear with good air entry and the fontanelle was flat and soft with a slight pulsation noted; neurological and abdominal examination was normal. The infant continued to have frequent desaturations and a full septic screen was performed but no organism was found. Chest X-ray, head ultrasound, echocardiogram and pH studies were normal. A capillary blood gas showed an elevated pCO2 of 60 mmHg. A sleep study was performed and a section of this is shown below. Each epoch represents 15 s. Multiple similar episodes were seen throughout the study.



1. Which of the following is the most likely diagnosis? Choose ONE answer ONLY from the following:

A. Obstructive sleep apnoea

B. Congenital hydrocephalus

C. Infantile spasms

D. Congenital central hypoventilation syndrome

E. Benign periodic breathing

Which of the following investigations would be most likely to confirm the diagnosis? Choose ONE answer ONLY from the following:

A. Genetic studies

B. Electroencephalogram

C. Flexible bronchoscopy

D. 24-h ECG

E. Echocardiogram

3. Which of the following would be the most appropriate management option for this infant? Choose ONE answer ONLY from the following:

A. Corticosteroid therapy

B. Invasive positive pressure ventilation

C. Non-invasive positive pressure ventilation

D. Surgical intervention

E. Home oxygen therapy

Answers

1. D

2. A

3. B

Congenital central hypoventilation syndrome (CCHS) is a rare genetic condition characterized by significant under breathing, particularly during quiet sleep, and a lack of response to hypoxia and hypercarbia. Unrecognized this condition can be fatal or result in hypoxic brain injury. Infants present with apnoeic episodes or cyanosis, with respiratory studies showing poor respiratory air flow associated with a lack of chest and abdominal wall movement, hypoxia and progressive hypercarbia.

CCHS is a lifelong condition, which is associated with multiple abnormalities in the autonomic nervous system, including reduced heart rate variability, reduced ability to produce a febrile response to illness and oesophageal dysmotility, and 10–15% have Hirschsprung disease. In 90% of CCHS patients the PHOX2b gene has been identified and genetic studies are widely available. The gene is located on chromosome 3p12 and codes for a homeobox transcription factor.

All patients require mechanical ventilatory support whilst sleeping and 35% require long-term 24-h ventilation. In infants this is best delivered as positive pressure mechanical ventilation via tracheostomy, although in some older children, who only require night-time ventilation, non-invasive bi-level pressure ventilation can be used; diaphragmatic pacing has also been used in some patients.

Umbilical Artery and vein cannulation

In centers where there is no facility for bedside x-ray or bed side ultrasound, we give you few tips to differentiate and confirm umbilical artery/vein cannulation; In extreme preterm babies, < 1 kg babies, differentiating between umbilical vein and artery by position can be sometimes difficult.

What we know:

1. Umbilical vein – single, Umbilical Artery – two in number ,exceptions can be there.
2. Umbilical vein – Collapsed structure, 12 'O' clock position, thin walled.
3. Umbilical Artery – thick walled more circular structure.

What we add:

4. While inserting the catheter into the Artery, one will feel a resistance, whereas catheter easily slips into a vein.
5. The most confirmatory tip is after inserting the catheter to the calculated position, check for the back flow, by transiently disconnecting the syringe, if blood recedes down, then this is your Umbilical vein; if blood back flows through the catheter, then this is your Umbilical Artery.