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the SQUARE

healthcare bulletin

- Growth & Development of Children
- Neonatal Sepsis
- Bronchiolitis
- Febrile Seizure
- Product Profile - Tazid®
- Updates on SARS

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"the SQUARE"

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From the Desk of Managing Editor

Dear Doctor:

Hello again and welcome to this edition of "the SQUARE" healthcare bulletin!

We are delighted by your momentous reply regarding "the SQUARE". We are also overwhelmed seeing the interest on this healthcare bulletin from our readers both from home and abroad. Your inspirations motivate us to produce certain articles those are informative, and entertaining. Our view is to keep you updated with the latest development in the field of medicine. At present we are trying to provide you a blend of medical information on every extent of medical science. If you feel that we are missing some areas that might enrich our publication, please feel free to comment on that. We appreciate your cooperation always.

In this issue we highlighted features like "Febrile Seizure", "Neonatal Sepsis", "Bronchiolitis". In addition, we focused on the essentials of "Growth and Development of Children". We also have a special feature on SARS in this issue.

Every effort has been made to make this issue interesting and we are quite sure that you will enjoy this issue as well.

On behalf of the management of SQUARE, wishing you all a very healthy, happy and prosperous life.

Omar Akramur Rab

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Growth & Development of Children

Children are not little adults. Until they reach the age of 15 or so they are not capable of reasoning as an adult. We often expect children to think like adults when they are not yet capable of doing so. The human brain is not fully developed until late adolescence or in the case of males sometimes early adulthood.

PHYSICAL, EMOTIONAL & SOCIAL DEVELOPMENT

This is an overview of child development from birth to five years of age. The time frames presented are averages and some children may achieve various developmental milestones earlier or later than the average but still be within the normal range.

Birth to 1 month: Feedings: 5-8 per day, Sleep: 20 hrs per day, and Sensory capacities: makes basic distinctions in vision, hearing, smelling, tasting, touch, temperature, and perception of pain; Generalized tension; Helpless and asocial.

2 to 3 months: Sensory capacities: color perception, visual exploration, oral exploration. Sounds: cries, coos, grunts. Motor ability: control of eye muscles, lifts head when on stomach. Delight, distress, smiles at a face. Visually fixates at a face may be soothed by rocking.

4 to 6 months: Sensory capacities: localizes sounds; Sounds: babbling, makes most vowels and about half of the consonants; Feedings: 3-5 per day, Motor ability: control of head and arm movements, purposive grasping, rolls over. Enjoys being cuddled, recognizes his mother. Distinguishes between familiar persons and strangers, no longer smiles indiscriminately. Expects feeding, dressing, and bathing.

7 to 9 months: Motor ability: control of trunk and hands, sits without support, crawls about. Specific emotional attachment to mother. Protests separation from mother. Enjoys "peek-a-boo".

10 to 12 months: Motor ability: control of legs and feet, stands, creeps, apposition of thumb and fore-finger. Language: says one or two words, imitates sounds, responds to simple commands. Feedings: 3 meals, 2 snacks; Sleep: 12 hours, 2 naps. Anger, affection, fear of strangers, curiosity, exploration. Responsive to own name. Wave bye-bye. Plays pat-a-cake, understands "no-no!" Gives and takes objects.

1 to 1½ years: Motor ability: creeps up stairs, walks (10-20 min), makes lines on paper with crayon. Dependent behavior, very upset when separated from mother; fear of bath. Obeys limited commands. Repeats a few words. Interested in his mirror image. Feeds himself.

1½ to 2 years: Motor ability: runs, kicks a ball, builds 6 cube tower (2yrs). Capable of bowel and bladder control. Language: vocabulary of more than 200 words; Sleep: 12 hours at night, 1-2 hours nap. Temper tantrums (1-3yrs), resentment of new baby. Does opposite of what he is told (18 months).

2 to 3 years: Motor ability: jumps off a step, rides a tricycle, uses crayons, builds a 9-10 cube tower. Language: starts to use short sentences, controls and explores world with language, stuttering may appear briefly. Fear of separation; Negativistic (2½ yrs), violent emotions, anger, differentiates facial expressions of anger, sorrow, and joy. Sense of humor (Plays tricks); Talks, uses "I" "me" "you", copies parents' actions. Dependent, clinging, possessive about toys, enjoys playing alongside another child. Negativism (2½ yrs). Resists parental demands. Gives orders. Rigid insistence on sameness of routine. Inability to make decisions.

3 to 4 years: Motor ability: stands on one leg, jumps up and down, draws a circle and a cross (4 yrs). Self-sufficient in many routines of home life. Affectionate toward parents. Pleasure in genital manipulation. Romantic attachment to parent of opposite sex (3 to 5 yrs), jealousy of same-sex parent. Imaginary fears of dark, injury, etc. (3 to 5 years). Likes to share, uses "we", cooperative play with other children, nursery school. Imitates parents. Beginning of identification with same-sex parent, practices sex-role activities. Intense curiosity & interest in other children's bodies. Imaginary friend.

4 to 5 years: Motor ability: mature motor control, skips, broad jumps, dresses himself, copies a square and a triangle. Language: talks clearly, uses adult speech, sounds, has mastered basic grammar, relates a story, knows over 2,000 words (5 yrs). Responsibility and guild. Feels pride in accomplishment. Prefers to play with other children, becomes competitive, prefers sex-appropriate activities. ▶

COGNITIVE DEVELOPMENT

The following information is based on the work of Jean Piaget, a developmental biologist who devoted his life to closely observing and recording the intellectual abilities of infants, children and adolescents. The stages of intellectual development formulated by Piaget appear to be related to major developments in brain growth.

Piaget's stage of cognitive development

Developmental Stage & Approximate Age	Characteristic Behavior
Sensory Motor Period(0 - 24 months)	
Reflexive Stage (0-2 months)	Simple reflex activity such as grasping, sucking.
Primary Circular Reactions (2-4 months)	Reflexive behaviors occur in stereotyped repetition such as opening and closing fingers repetitively.
Secondary Circular Reactions (4-8 months)	Repetition of change actions to reproduce interesting consequences such as kicking one's feet to more a mobile suspended over the crib.
Coordination of Secondary Reactions (8-12 months)	Responses become coordinated into more complex sequences. Actions take on an "intentional" character such as the infant reaches behind a screen to obtain a hidden object.
Tertiary Circular Reactions (12-18 months)	Discovery of new ways to produce the same consequence or obtain the same goal such as the infant may pull a pillow toward him in an attempt to get a toy resting on it.
Invention of New Means Through Mental Combination (18-24 months)	Evidence of an internal representational system. Symbolizing the problem-solving sequence before actually responding. Deferred imitation.
The Preoperational Period (2-7 years)	
Preoperational Phase (2-4 years)	Increased use of verbal representation but speech is egocentric. The beginnings of symbolic rather than simple motor play. Transductive reasoning. Can think about something without the object being present by use of language.
Intuitive Phase (4-7 years)	Speech becomes more social, less egocentric. The child has an intuitive grasp of logical concepts in some areas. However, there is still a tendency to focus attention on one aspect of an object while ignoring others. Concepts formed are crude and irreversible. Easy to believe in magical increase, decrease, disappearance. Reality not firm. Perceptions dominate judgement. In moral-ethical realm, the child is not able to show principles underlying best behavior. Rules of a game not develop, only uses simple do's and don'ts imposed by authority.
Period of Concrete Operations (7-11 years)	Evidence for organized, logical thought. There is the ability to perform multiple classification tasks, order objects in a logical sequence, and comprehend the principle of conservation. Thinking becomes less transductive and less egocentric. The child is capable of concrete problem-solving. Some reversibility now possible (quantities moved can be restored such as in arithmetic: 3+4 = 7 and 7-4 = 3, etc.) Class logic-finding bases to sort unlike objects into logical groups where previously it was on superficial perceived attribute such as color. Categorical labels such as "number" or "animal" now available.
Period of Formal Operations (11-15 years)	Thought becomes more abstract, incorporating the principles of formal logic. The ability to generate abstract propositions, multiple hypotheses and their possible outcomes is evident. Thinking becomes less tied to concrete reality. Formal logical systems can be acquired. Can handle proportions, algebraic manipulation, other purely abstract processes. If a + b = x then x = a - b. If ma/ca = IQ = 1.00 then Ma = CA. Prepositional logic, as-if and if-then steps. Can use aids such as axioms to transcend human limits on comprehension.

PSYCHOSOCIAL ASPECT OF CHILDREN

Each new phase of child development presents unique challenges. The infancy years are a time of irregular sleep-wake cycles and a need for almost constant care and attendance. During the toddler years, the child's strivings for autonomy and independence should be supported and encourage within appropriate limits and without letting the child become the family tyrant. In the subsequent years parents should have the ability to face the competitive challenges and should require a balanced respect for the child's evolving wishes to be independent while still setting limits that maintain safety and respect for others.

Early free walking

Preschoolers

The push for independence and autonomy begins in the second year of life. Preschool children typically want to have their way even when it poses a danger or breaches generational boundaries. Children may try to decide when and what the family eats, what time is bedtime, and who sleeps in which bed, all as part of their rudimentary push to become independent. Parents should respect the child's wish for self-determination as well as set limits and should provide guidance so that the child does not become tyrannical or out of control.

Childhood fears and anxieties

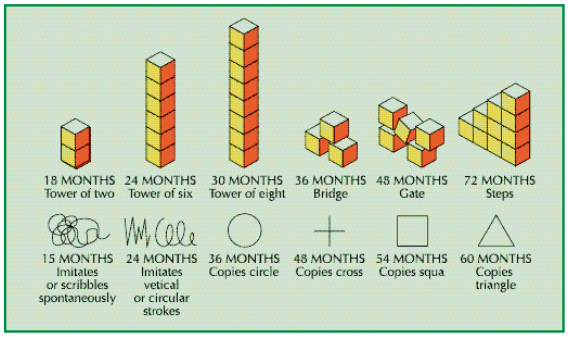
During the elementary school years, children experience of challenges that await outside their homes. Parental support of development of these social and emotional skills must be balanced with realistic definition of success. Persistent separation anxiety on the part of parents and unrealistic standards of performance can contribute to problems for the child in regulating anxiety and developing self-esteem during these years.

Independent feeding. A 15-month-old child uses fine motor skills to use a spoon independently

Sequence of developmental anxiety

Age at first appearance	Source of anxieties
Early infancy	sudden loud noises, unpredictable stimuli, loss of postural support, heights.
1 year	Stranger, unfamiliar situations and objects. Beginning of separation distress.
2-6 years	Animals, darkness, imaginary creatures, (ghosts and monsters etc.)
School age	Bodily injury, physical danger. Fear of loss of loved one.
Teens and adulthood	Fear of failure (eg test anxiety), concerns about social acceptance, loss of a loved one, physical danger, natural disasters.

Although the manifestations of many developmental anxieties, such as separation distress and fear of the dark, may wax and wane over months or years, most specific childhood fears are transient (days to weeks in duration) and not associated with substantial interference with daily life. In most of the cases, parents should be reassured about the developmental nature of fears; the parents can then reassure their children that they will be fine even though they feel frightened at times. Approximately 2-3% of preschool age children have fears troublesome enough to require specific mental health interventions.



Fine motor tasks

Reference: *Current Pediatric Diagnosis and Treatment; 16th Edition; 2003, Internet. Atlas of Pediatric Physical Diagnosis; 2nd Edition.*

Neonatal Sepsis

Neonatal sepsis is a major cause of morbidity and mortality among newborns in the developing world. Home delivery, unhygienic environment & poor socioeconomic status contribute the increase rate of mortality due to neonatal sepsis. The fetus and the newborn infant are very susceptible to infections. Neonatal sepsis can be caused by bacterial, fungal, parasitic or viral pathogens. There are three major routes of infection (1) blood-borne transplacental infection of the fetus; (2) ascending infection due to disruption of amniotic membranes; and (3) infection upon passage through an infected birth canal or exposure to infected blood at delivery.

Neonatal sepsis may be categorized as early or late onset. Pneumonia is more common in early-onset sepsis, whereas meningitis and/or bacteremia are more common in late-onset sepsis. Eighty-five percent of newborns with early-onset infection present within 24 hours, 5% present at 24-48 hours, and a smaller percentage of patients present between 48 hours and 6 days of life. Onset is most rapid in premature neonates. The microorganisms most commonly associated with early-onset infection include group B *Streptococcus* (GBS), *Escherichia coli, Haemophilus influenzae*, and *Listeria monocytogenes*.

Late-onset sepsis syndrome occurs at 7-90 days of life and is acquired from the care giving environment. Organisms that have been implicated in causing late-onset sepsis syndrome include coagulase-negative *Staphylococci, Staphylococcus aureus, E coli, Klebsiella, Pseudomonas, Enterobacter, Candida, GBS, Serratia, Acinetobacter,* and anaerobe. The infant's skin, respiratory tract, conjunctivae, gastrointestinal tract, and umbilicus may become colonized from the environment, leading to the possibility of late-onset sepsis from invasive microorganisms. Vectors for such colonization may include vascular or urinary catheters, other indwelling lines, or contact from caregivers with bacterial colonization.

EPIDEMIOLOGY

The incidence of early onset (<5 days) neonatal bacterial infection is 4-5 per 1000 live births. If rupture of the membranes occurs more than 24 hours prior to delivery, the infection rate increases to 10 per 1000 live births. If there is early rupture of membranes with chorioamnionitis, the infection rate increases further to 1 per 10 live births. Irrespective of membrane rupture, infection rates are five times higher in preterm than in term infants. Meningitis occurs in one third of sepsis cases.

Race: Black infants have an increased incidence of GBS disease and late-onset sepsis. This is observed even after controlling for risk factors of low birth weight and decreased maternal age.

Congenital rubella. This newborn had the full-blown picture of the "expanded rubella syndrome," including a generalized blueberry muffin rash, diffuse petechiae, hepatosplenomegaly, early onset of jaundice and neurologic depression. (Courtesy of Dr. Michael Sherlock)

Sex: The incidence of bacterial sepsis and meningitis, especially for gram-negative enteric bacilli, is higher in males than in females.

Age: Studies have shown that premature infants have an increased incidence of sepsis. The incidence of sepsis is significantly higher in infants with very low birth weight (<1000 g), at 26 per 1000 live births, than in infants with a birth weight of 1000-2000 g, at 8-9 per 1000 live births. The risk for death or meningitis from sepsis is higher in infants with low birth weight than in full-term neonates. ▶

MORTALITY/MORBIDITY

The mortality rate in neonatal sepsis may be as high as 50% for infants who are not treated. Infection is a major cause of fatality during the first month of life, contributing to 13-15% of all neonatal deaths. Neonatal meningitis, a serious morbidity of neonatal sepsis, occurs in 2-4 cases per 10,000 live births and significantly contributes to the mortality rate in neonatal sepsis; it is responsible for 4% of all neonatal deaths.

RISK FACTORS

A. Major

1. Maternal prolonged rupture of membranes >24 hours
2. Intrapartum maternal fever >38˚ C (>100.4˚ F)
3. Chorioamnionitis
4. Sustained fetal tachycardia >160 beats per minute.

B. Minor

1. Intrapartum maternal fever >37.5˚ C (>99.5˚ F)
2. Twin gestation
3. Premature infant (<37 weeks)
4. Maternal leukocytosis (W.B.C.>15000)
5. Rupture of membranes > 12 hours
6. Tachypnea (<1 hour)
7. Maternal Group B Streptococcus colonization
8. Low APGAR (<5 at 1 minute)
9. Low birth weight (<1500 grams)
10. Foul lochia
11. Presence of open congenital anomalies.

ETIOLOGIES

The infectious agents associated with neonatal sepsis have changed over the past 50 years. *S aureus* and *E coli* were the most common infectious hazards for neonates in the 1950s in the United States. GBS then replaced *S aureus* as the most common gram-positive agent, causing early-onset sepsis during the next decades. During the 1990s, GBS and *E coli* continued to be associated with neonatal infection; however, coagulase-negative *S aureus* is now observed more frequently. Additional organisms, such as *L monocytogenes, Chlamydia pneumoniae, Haemophilus influenzae, Enterobacter aerogenes,* and species of Bacteroides and Clostridium have also been identified in neonatal sepsis. But, increased prevalence of gram-negative septicemia specially *E. coli* is found in our country, India and Pakistan. The prevalence of *E. coli* may have been due to the fact that it is commonly found as part of the intestinal and vaginal flora, and most deliveries are conducted at home, presumably under conditions of poor hygiene.

Meningoencephalitis and neonatal sepsis syndrome can also be caused by infection with adenovirus, enterovirus, or coxsackievirus. Additionally, sexually transmitted diseases and viral diseases, such as gonorrhea, syphilis, herpes simplex virus (HSV), cytomegalovirus (CMV), hepatitis, HIV, rubella, toxoplasmosis, *Trichomonas vaginalis*, and Candida species, have all been implicated in neonatal infection. Bacterial organisms with increased

Table: *Organisms Isolated in 30 Cases of Blood Culture Positive Septicemia in Relation to Onset of Disease, Birth Weight and Gestational Age*

Organisms	Age of onset		Birth wt (g)			Gestational age				
	Early	Late	<1500	1500-2500	>2500	Preterm	Term	Post-term	Total	Percentage
E. coli	3	6	1	5	3	5	3	1	9	30.0
K. pneumoniae	3	4	1	3	3	4	3	-	7	23.3
S. aureus	2	3	-	2	3	1	4	-	5	16.7
P. aeruginosa	1	2	1	1	1	2	1	-	3	10.0
Streptococcus spp.	1	2	-	2	1	1	2	-	3	10.0
Acinetobacter	1	1	-	1	1	1	1	-	2	06.7
Providencia rettgeri	1	-	-	1	-	1	-	-	1	03.3
Total	**12**	**18**	**3**	**15**	**12**	**15**	**14**	**1**	**30**	**100**

Source: A.S.M. Nawshad Uddin Ahmed, M.A.K. Azad Chowdhury, Mahbul Hoque and Gary L. Darmstadt; Clinical and Bacteriological Profile of Neonatal Septicemia in a Tertiary level Pediatric Hospital in Bangladesh; Indian Pediatrics 2002; 39:1034-1039

antibiotic resistance have also emerged and have further complicated the management of neonatal sepsis.

SIGNS

A. Respiratory distress (90%)

1. Tachypnea
2. Apnea
3. Hypoxia
4. Flaring or grunting
5. Irregular respirations

B. Temperature instability sustained over 1 hour (30%)

1. Newborn temperature < 97˚ F (36˚ C)
2. Newborn temperature > 99.6˚ F (37˚ C)

C. Gastrointestinal symptoms

1. Vomiting
2. Diarrhea
3. Abdominal distention
4. Ileus
5. Poor feeding
6. Splenomegaly

D. Neurologic

1. Activity decreased or lethargy
2. Hyporeflexia or hypotonia
3. Tremor or seizure
4. Irritability
5. High pitched cry
6. Swelling of fontanel

E. Cardiovascular

1. Hypotension 2. Metabolic acidosis 3. Tachycardia

F. Skin

1. Pallor or skin mottling
2. Petechiae or purpura
3. Cold or clammy skin
4. Cyanosis
5. Jaundice

PATHOPHYSIOLOGY

The pathogenesis of early onset bacteremia involves the complex interaction of maternal-fetal colonization, transplacental immunity and physical and cellular defenses of the fetus and mother. Studies have repeatedly identified prematurity, prolonged rupture of membranes and maternal chorioamnionitis as risk factors for congenital bacteremia.

Staphylococcus epidermidis, or coagulase-negative Staphylococcus is increasingly seen as a cause of nosocomial or late-onset sepsis, especially in the premature infant. It is considered the leading cause of late-onset infections for this population. Its prevalence is related to its preference for the plastic mediums found in cannulas and shunts, which increases its introduction via umbilical catheters and other indwelling lines. The bacterial capsule polysaccharide adheres well to the plastic polymers of the catheters. The adherence creates a capsule between microbe and catheter, which prevents C3 deposition and phagocytosis. Also, proteins found in the organism [AtlE and SSP-1] enhance attachment to the surface of the catheter.

Healthy survival of premature infants born at 25 weeks' gestation and later is now the norm

The neonate is unable to respond effectively to infectious hazards because of deficits in the physiological response to infectious agents. The neonatal polymorphonuclear cell is defective in chemotaxis and killing capacity. Neonatal monocyte concentration and function are at adult levels; however, macrophage chemotaxis is impaired and continues to exhibit decreased function into early childhood. Cytokine production by macrophages is decreased, which may be associated with a corresponding decrease in T-cell production. Also, neonatal T cells do not effectively produce the cytokines that assist with B-cell stimulation and differentiation and with bone marrow stimulation of granulocyte/monocyte proliferation.

The fetus is capable of complement protein production as early as 6 weeks gestational age; however, wide variability exists among individual neonates in the concentration of the components of the complement system. Deficiencies appear to be greater for neonates in the alternative pathway than in the classic pathway.

The physical and chemical barriers to infection in the human body are present in the newborn but are ▶

functionally deficient. Skin and mucus membranes are broken down easily in the premature infant. Neonates who are ill and/or premature are additionally at risk because of the invasive procedures that breach their physical barriers to infection. Because of the interdependence of the immune response, these individual deficiencies of the various components of immune activity in the neonate conspire to create a hazardous situation for the neonate exposed to infectious threats.

INVESTIGATIONS

Laboratory:

- Complete Blood Count (findings suggestive of sepsis)
  1. WBC count <5000 /mm^3 or > 25000 /mm^3
  2. Absolute Neutrophil Count (ANC) < 1000 /mm^3
  3. Bands to total Neutrophil Count ratio > 0.2
  4. Immature to mature Neutrophil Count ratio > 0.2
- Blood Culture (positive in 5-10% of neonatal sepsis)
- Arterial Blood Gas: indicated for signs or symptoms of hypoxia
- Lumbar Puncture
  1. Indications
     a. Sepsis is considered primary diagnosis
     b. Blood culture positive
     c. Neurologic signs or symptoms
  2. Specific Tests
     a. CSF examination
     b. CSF culture
     c. CSF antigens
- Urinalysis and Urine Culture
  1. Indicated for late-onset neonatal sepsis
  2. Not useful in perinatal period (age <3 days old)

Imaging studies:

- Chest Radiographs
- CT Scan: may be needed in case of complex meningitis to visualize any blockage in the CSF flow.
- Head Ultrasonograms in neonates with meningitis.

MANAGEMENT

A. Supportive

1. Temperature regulation: maintenance of neutral thermal environment
2. Maintenance of fluid and electrolyte balance
3. Adequate oxygenation and ventilation
4. Maintenance of tissue perfusion: volume expanders, such as fresh blood and plasma, and use of inotropic drugs for improved cardiac contractility as necessary
5. Prevention and control of seizures: anti-convulsant therapy
6. Early recognition of bacteremia and supportive therapy probably account for recent improvements in outcome and survival.

B. Antimicrobial Therapy

Intravenous antibiotic therapy should be initiated as soon as possible in neonates suspected of sepsis.

1. Maternal antenatal treatment of suspected infection begins treatment of the fetus.
2. Empiric therapy pending the results of bacterial cultures usually consists of a penicillin and an aminoglycoside (ampicillin and gentamycin).
3. Third generation cephalosporin antimicrobials (cefotaxime) may replace the preceding regimen for treatment of neonatal Gram negative bacilli sepsis and/or meningitis.
4. Gentamycin levels must be obtained after the second or third dose, levels greater than 2 mcg/cc require dosage adjustment. A peak level of 6-9 mcg/cc is therapeutic.

In the United States and Canada, the most current approach to treat early-onset neonatal sepsis syndrome includes combined IV aminoglycoside and penicillin antibiotic therapy. The specific antibiotics to be used are chosen on the basis of maternal history and prevalent trends of organism colonization in individual nurseries. Cephalosporins are attractive in the treatment of nosocomial infection because of their lack of dose-related toxicity and adequate serum and CSF concentration; however, resistance by gram-negative organisms has occurred with their use. ▶

C. Immunotherapy

1. Exchange transfusion, granulocyte transfusion, granulocyte colony stimulation factor and intravenous (IV) immunoglobulin (IG) are still considered investigational therapies for neonatal sepsis.
2. These interventions may offer increased survival for rapidly deteriorating neonates. Such neonates should be care for in a neonatal intensive care unit.

D. Extracorporeal Membrane Oxygenation (ECMO)
Neonates who are not adequately treated by other modalities may be candidates for ECMO therapy. This option should be considered early in the course of treatment.

Baby with Neonatal Sepsis

PREVENTION

The empiric therapy of neonates born after premature and/or prolonged rupture of membranes remains controversial. Some investigators have offered a scoring system to guide therapy.

A. Term neonates with prolonged rupture of membranes (greater than 24 hours) who are asymptomatic need only be carefully observed.
B. Preterm neonates 36 weeks gestation or less and neonates who have other risk factors for infection should have blood cultures and neutrophil profiles obtained. Antimicrobial therapy may be indicated for these neonates pending bacteriologic results.
C. Antibiotic therapy of the mother following premature or prolonged rupture of membranes may lower the incidence of neonatal group B streptococcal (GBS) bacteremia. Penicillin prophylaxis in the neonate has also prevented subsequent GBS infection when given shortly after birth.

COMPLICATIONS

Hypoglycemia, metabolic acidosis, coagulopathy, renal failure, myocardial dysfunction, intracranial hemorrhage and jaundice/kernicterus can be associated with neonatal bacteremia.

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Bronchiolitis

Bronchiolitis is an acute, infectious, inflammatory disease of the upper and lower respiratory tract that results in obstruction of the small airways. It occurs during the first 2 years of life, with a peak incidence at approximately 6 months of age. Boys are affected 1.7 times more than girls; the male-to-female ratio of hospitalization among these children is 1.5 :1.

Cyanosis. This critically ill infant exhibits cyanosis and poor skin perfusion

The incidence is highest during winter and early spring months.

Two respiratory syncytial virus (RSV) subtypes, A and B, have been identified, with subtype A causing most severe infections. One subtype usually predominates during a given season; thus, "good" years and "bad" years occur for RSV disease. The disease is highly contagious. Viral shedding in nasal secretions continues for 6-21 days after development of symptoms. The incubation period is 2-5 days.

MORTALITY/MORBIDITY

RSV bronchiolitis accounts for more than 90,000 pediatric hospitalizations and up to 4,500 deaths annually. Overall, the mortality for children hospitalized for bronchiolitis in different series is 0.2-7%. This large variability is based on investigations of different cohorts with different risk factors and different points in time relative to modern intensive care. Very recent studies in children with respiratory syncytial virus bronchiolitis and without comorbidities show a 2-3% death rate regardless of whether the children had congenital heart disease with pulmonary hypertension.

ETIOLOGY

RSV is the most commonly isolated agent in 75% of children younger than 2 years and who are hospitalized for bronchiolitis.

Agents that cause wheezing-associated respiratory infections include the following:

- RSV causes 20-40% of all cases and 44% of cases involving children younger than 2 years.
- Para influenza virus causes 10-30% of all bronchiolitis cases.
- Adenovirus accounts for 5-10% of cases of bronchiolitis. Adenovirus may be associated with long-term complications, including bronchiolitis obliterans and unilateral hyperlucent lung syndrome (Swyer-James syndrome)
- Influenza virus accounts for 10-20% of cases of bronchiolitis.
- *Mycoplasma pneumoniae* accounts for 5-15% of cases of bronchiolitis, particularly among older children and adults.

Abundant evidence reveals that complex immunologic mechanisms play a role in the pathogenesis of RSV bronchiolitis. Type I allergic reactions mediated by the immunoglobulin E (IgE) antibody may account for clinically significant bronchiolitis. Babies who are nursed with colostrum rich in immunoglobulin A (IgA) appear relatively protected from bronchiolitis.

RISK FACTORS

- Low birth weight, particularly premature infants
- No history of being breastfed
- Lower socioeconomic group
- Crowded living conditions and/or day care
- Parental smoking
- Chronic lung disease, particularly bronchopulmonary dysplasia
- Severe congenital or acquired neurologic disease
- Congenital heart disease with pulmonary hypertension
- Congenital or acquired immune deficiency diseases

PATHOPHYSIOLOGY

Necrosis of the respiratory epithelium is one of the earliest lesions in bronchiolitis. Proliferation of goblet cells results in excessive mucus production, while epithelial regeneration with nonciliated cells impairs elimination of secretions. Lymphocytic infiltration may result in submucosal edema.

The pathology results in obstruction of bronchioles by inflammation, edema, and debris, leading to hyperinflation, increased airway resistance, atelectasis, and ventilation-perfusion mismatching.

Infants have small airways, high closing volumes, and insufficient collateral ventilation; thus, they are affected most often. Recovery begins with regeneration of bronchiolar epithelium after 3-4 days, but cilia do not ▶

appear for up to 2 weeks. Mucus plugs are removed by macrophages.

CLINICAL MANIFESTATION

Most affected infants have a history of exposure to older children or adult with minor respiratory diseases within the week of preceding onset of illness. The infant is first noted to have a mild upper respiratory tract infection with serous nasal discharge and sneezing. These symptoms usually last several days and may be accompanied fever of 38.5 to 39˚C (101-102˚ F) and diminish appetite. There is then the gradual development of respiratory distress characterized by paroxysmal wheezy cough, dyspnea, and irritability. Bottle-feeding may be a particularly difficult since the rapid respiratory rate may not permit time for sucking and swallowing. In mild cases symptoms disappear in 1-3 days. On occasion, in the more severely affected patients, symptoms may develop within several hours, and the course is protracted. Other systemic manifestations, such as vomiting and diarrhea, are usually absent. The infant is commonly afebrile, has only a low-grade fever, or may be hypothermic.

Examination reveals a tachypneic infant, often in extreme distress. Respiratory rate range from 60-80/ min, severe air hunger and cyanosis may be present. There is flaring of alae of nasi, and use of accessory muscles of respiration results in intercostals and subcostal retraction, which are shallow because of persistence distention of the lungs by the trapped air. The liver and spleen may be palpable several centimeters below the costal margins as a result of depression of the diaphragm due to overinflation. Widespread fine rales may be heard at the end of inspiration and in early expiration. The expiratory phase of breathing is prolonged, and wheezes are usually audible. In the most severe cases, breath sounds are barely audible when bronchiolitic obstruction in nearly complete.

X-ray reveals hyperinflation of the lungs and an increased anterior posterior diameter on lateral view. Scattered areas of consolidation are found in about one third of the patients and are due to either of atelectasis secondary to obstruction or to inflammation of alveoli.

The white blood cell and differential counts are usually within normal limits. Lymphopenia, commonly associated with many viral illnesses, is usually not found. Nasopharyngeal cultures reveal normal flora. Virus may be demonstrated in nasopharyngeal secretions by immunofluorescence, in a rise in blood antibody titers, or in cultures.

DIFFERENTIAL DIAGNOSIS

The condition most commonly confused bronchial asthma. Asthma occurs uncommonly in the first year of life, but frequently after this period. The presence of one or more of the following favors the diagnosis of asthma: a family history of asthma, repeated attack in same infant, sudden onset without preceding infection, markedly prolong expiration, eosinophilia. Repeated attacks represent an important differential points; fewer than 5% of recurrent attacks of clinical bronchiolitis have a viral infections as a cause. Other entities that may be confused with acute bronchiolitis are congestive heart failure, foreign body in the trachea, pertussis, organic phosphorus poisoning, cystic fibrosis, and bacterial bronchopneumonias associated with generalized obstructive emphysema.

TREATMENT

Despite the prominent role that inflammation plays in the pathogenesis of air way obstruction, corticosteroids have not been proven beneficial in improving clinical status of bronchiolitis. Infants with respiratory distress should be hospitalized.

Indications for hospital admission include the followings:

- Oxygen saturation monitored by pulse oximetry below 92% in room air
- Younger than 6 months and unable to maintain oral hydration
- Markedly elevated respiratory rate
- History of chronic cardiorespiratory disease
- Desaturation in 40% oxygen (3-4 L/min oxygen), cyanosis
- Extra pulmonary symptoms
- Apnea and acidosis are indicators for pediatric intensive care referral.

Hospital care

- Humidified oxygen administration to maintain transcutaneous saturation above 92%
- The infants is usually more comfortably sitting at a 30-40˚ angle or with the head and neck slightly elevated
- Fluid replacement to correct and prevent dehydration
- Nasal & oral suction ▶

- Patient should be monitored carefully in order to detect apnea
- Temperature regulation
- Mechanical ventilation: Infants with bronchiolitis occasionally require mechanical ventilation in cases of recurrent apnea or increased work of breathing with respiratory failure. The treatment of these patients is supportive, with provision of adequate oxygen, ventilation, and hydration.

Sedative should be avoided whenever possible because of potential depression on respiration. Current experimental therapies for infants with pulmonary insufficiency from bronchiolitis include surfactant and nitric oxide.

Ribavirin , an antiviral agent, is effective in reducing the severity of bronchiolitis due to RSV infection. Its use is indicated under 2 years of age who have severe infection documented by fluorescent antibodies or culture and whose hospitalization is likely to exceed more than 3 days. It should be given in selected patients at high risk for serious RSV infection like cardiac disease (Cyanotic congenital heart disease), pulmonary disease or immunodeficiency disease. Although ribavirin treatment for RSV infections has been controversial due to aerosal route of administration, drug cost, toxicities and adve-rse effects. It is contraindicated for the patients on ventilators because of risk of mechanical interference with ventilator function.

Flaring: reflexive widening of the nares may be seen in infants with respiratory distress

Antibiotics have no therapeutic value unless there is secondary bacterial pneumonia. Corticosteroid are not beneficial and may, under certain condition, be harmful. Bronchodilating drug, although they may increase restlessness, are frequently used. Occasionally patients may progress rapidly to respiratory failure requiring ventilatory assistance.

COMPLICATIONS

In most cases, the disease is mild and self-limiting. In infants who are immunosuppressed and those with preexisting heart or lung disease, RSV bronchiolitis can result in any of the followings:

- Acute respiratory distress syndrome (ARDS)
- Bronchiolitis obliterans
- Congestive heart failure
- Secondary infection
- Myocarditis
- Arrhythmias
- Chronic lung disease.

Complications of therapy include the followings

- Ventilator-induced barotrauma
- Nosocomial infection
- Beta-agonist-induced arrhythmias
- Nutritional and metabolic abnormalities.

Strict attention to fluid and nutritional therapy, avoidance of unnecessary invasive monitoring, infection control, and judicious ventilator management, including the use of high-frequency oscillatory ventilation to avoid volutrauma/ barotrauma may preclude many of these complications.

COURSE & PROGNOSIS

The most critical phage of illness occurs during the first 24-72 hours after the onset of cough and dyspnea. During this period the infant appears desperately ill, apneic spells occurs in the very small infants, and respiratory acidosis is likely to be noted. After the critical period improvement occurs.

PREVENTION

- Most cases of bronchiolitis are not readily preventable because the viruses that cause this disorder are common in the environment. Careful attention to hand washing, especially around infants, can aid in the prevention or spread of respiratory viruses. Family members with an upper respiratory infection should be especially careful around infants – hand washing frequently, and certainly, before handling the child.
- At this date, there is no RSV vaccine available. However, there are two effective prevention products available for infants at high risk for developing severe disease from RSV. The products are RSV-IGIV and palivizumab.

References: **1.** e-medicine. **2.** Medline plus. **3.** Nelson paediatric. **4.** Current Pediatric Diagnosis and Treatment; 16th Edition. **3.** Atlas of paediatric Physical Diagnosis; 2nd Edition.

Febrile Seizure

Febrile seizures are the most common type of seizures observed in the pediatric age group. Although described by the ancient Greeks, it was not until this century that febrile seizures were recognized as a distinct syndrome separate from epilepsy. In 1980, American National Institutes of Health described a febrile seizure as an event in infancy or childhood usually occurring between three months and five years of age, associated with fever, but without evidence of intracranial infection or defined cause. In developed countries about 2% to 4% of children have febrile seizures by their fifth birthday but the frequency may be greater in Asia. About one third of the patients have at least one recurrence.

Febrile seizures are usually benign but can cause considerable parental anxiety. Recent studies have defined a group of patients at higher risk for febrile seizures and a group likely to have recurrence of febrile seizures.

Type

Epidemiologic studies have led to the division of febrile seizures into 3 groups, as follows:

- Simple febrile seizures
- Complex febrile seizures, and
- Symptomatic febrile seizures.

Simple febrile seizure

- The setting is fever in a child aged 6 months to 5 years.
- The single seizure is generalized and lasts less than 15 minutes.
- The child is otherwise neurologically healthy and without neurological abnormality by examination or by developmental history.
- Fever (and seizure) are not caused by meningitis, encephalitis, or other illness affecting the brain.

Complex febrile seizure

- Age, neurological status before the illness, and fever are the same as for simple febrile seizure.
- This seizure is either focal or prolonged (ie, >15 min), or multiple seizures occur in close succession.

Symptomatic febrile seizure

- Age and fever are the same as for simple febrile seizure.
- The child has a preexisting neurological abnormality or acute illness.

Febrile seizures occur in 2-5% of children aged 6 months to 5 years in industrialized countries. Among children with febrile seizures, about 70-75% have only simple febrile seizures, another 20-25% have complex febrile seizures, and about 5% have symptomatic febrile seizures.

MORTALITY/MORBIDITY

Febrile seizures are usually benign.

- Children with a previous simple febrile seizure are at increased risk of recurrent febrile seizures; this occurs in approximately one third of cases.
- The risk of having recurrent simple febrile seizures varies, depending on age. Children younger than 12 months at the time of their first simple febrile seizure have approximately a 50% probability of having recurrent febrile seizures. Children older than 12 months at the time of their first event have approximately a 30% probability of a second febrile seizure; of those that do have a second febrile seizure, 50% have a chance of having at least 1 additional recurrence.
- Children who have simple febrile seizures are at an increased risk for epilepsy. The rate of epilepsy by age 25 years is approximately 2.4%, which is about twice the risk in the general population.
- Simple febrile seizures do not lower intelligence (ie, cause a learning disability) or are associated with increased mortality.
- Risk factors for epilepsy later in life include complex febrile seizure, family history of epilepsy or neurologic abnormality, and developmental delay. Patients with 2 risk factors have up to a 10% chance of developing afebrile seizures.

CAUSES

***Race*:** Febrile seizures occur in all races.

***Sex*:** Males have a slightly (but definite) higher incidence of febrile seizures.

***Age*:** Simple febrile seizures occur most commonly in children aged 6 months to 5 years.

***Disease*:** Epidural hematoma, Epidural & subdural ▶

infections, Meningitis, Bacteremia & sepsis, Fever in children, and Status epilepticus

Risk factors

- Family history of febrile seizures
- High temperature
- Parental report of developmental delay
- Neonatal discharge at an age greater than 28 days (suggesting perinatal illness requiring hospitalization)
- Day care attendance
- Presence of 2 of these risk factors increases the probability of a first febrile seizure to about 30%.

Interestingly, there are no data to support the theory that a rapid rise in temperature is a cause of febrile seizures.

- About one third of all children with a first febrile seizure experience recurrent seizures.
  - Risk factors for recurrent febrile seizures include the followings:
    - Young age at time of first febrile seizure
    - Relatively low fever at time of first seizure
    - Family history of afebrile seizure in a first degree relative
    - Brief duration between fever onset and initial seizure
  - Patients with all 4 risk factors have greater than 70% chance of recurrence. Patients with no risk factors have less than a 20% chance of recurrence.

PATHOPHYSIOLOGY

Febrile seizures occur in young children at a time in their development when the seizure threshold is low. This is a time when young children are susceptible to frequent infections and respond with comparably higher temperatures.

Complex febrile seizures may indicate a more serious disease process, such as meningitis, abscess, or encephalitis. Viral illnesses are the predominant cause of febrile seizures. Recent literature documented the presence of human herpes simplex virus 6 (HHSV-6) as the etiologic agent in roseola in about 20% of a group of patients presenting with their first febrile seizures. Shigella gastroenteritis also has been associated with febrile seizures.

HISTORY

- Children with simple febrile seizures are neurologically and developmentally healthy before and after the seizure
- Focus on the history of fever, duration of fever, and potential exposures to illness
- A history of the cause of fever (eg, viral illnesses, gastroenteritis) should be elucidated
- Recent antibiotic use is particularly important because partially treated meningitis must be considered
- A history of seizures, neurologic problems, developmental delay, or other potential causes of seizure (eg, trauma, ingestion) should be sought
- The type of seizure (generalized or focal) and its duration should be described to help differentiate between simple and complex febrile seizures
- They do not experience a seizure in the absence of fever
- The seizure is described as either a generalized clonic or a generalized tonic-clonic seizure
- Signs of a focal seizure during the onset or in the postictal period (eg, initial clonic movements of 1 limb or of the limbs on 1 side, a weak limb postictally) would rule out a simple febrile seizure
- Similarly, simple febrile seizure activity does not continue for more than 15 minutes, although a postictal period of sleepiness or confusion can extend beyond the 15-minute maximum
- Simple febrile seizures often occur with the initial temperature elevation at the onset of illness. The seizure may be the first indication that the child is ill. While no clear cutoff is known, a rectal temperature under 38°C should raise concern that the event was not a simple febrile seizure.

PHYSICAL EXAMINATION

- The underlying cause for the fever should be sought
- A careful physical examination often reveals otitis media, pharyngitis, or a viral exanthem
- Serial evaluations of the patient's neurologic status are essential
- Check for meningeal signs as well as for signs of trauma or toxic ingestion. ▶

INVESTIGATION

Lab Studies

- Routine laboratory studies usually are not indicated unless they are performed as part of a search for the source of a fever
- Electrolytes assessments are rarely helpful in the evaluation of febrile seizures
- Patients with febrile seizures have an incidence of bacteremia similar to patients with fever alone.

Imaging Studies

- A CT scan usually is not necessary in the evaluation of a child with a first simple febrile seizure. CT scan should be considered in patients with complex febrile seizures
- An electroencephalogram (EEG) usually is not necessary in the routine evaluation of a child with a first simple febrile seizure.

Procedures

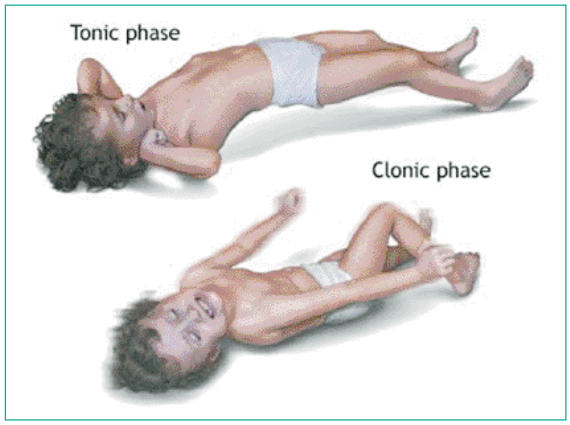
Lumbar puncture

- Controversy exists regarding the need for a lumbar puncture in a child presenting with a simple febrile seizure
- Certainly, meningitis can present with a seizure, although the seizure usually is not the only sign of meningitis
- Several reviews of the medical literature report less than 5% incidence of meningitis in children presenting with seizures and fever
- Risk factors for meningitis in patients presenting with seizure and fever include the followings:
  - A physician visit within 48 hours
  - Seizure activity at the time of arrival in the ED (Emergency Department)
  - Focal seizure, suspicious physical examination findings (eg, rash, petechiae) cyanosis, hypotension, or grunting
  - Abnormal neurologic examination.

In 1996, the American Academy of Pediatrics (AAP) recommended that a lumbar puncture be strongly considered in patients younger than 12 months presenting with fever and seizure. The AAP also recommended that a lumbar puncture be considered in patients aged 12-18 months. A lumber puncture is not routinely necessary in patients older than 18 months. This recommendation is conservative, but it takes into account the difficulty in recognizing meningitis in infants and young children and the range of experience in the evaluation of pediatric patients among health care providers.

TREATMENT

Based on the risks and benefits of the effective therapies, neither continuous nor intermittent anticonvulsant therapy is recommended for children with 1 or more simple febrile seizures. The American Academy of Pediatrics recognizes that recurrent episodes of febrile seizures can create anxiety in some parents and their children, and, as such, appropriate education and emotional support should be provided.



Phases of febrile seizure

Activity: No activity restrictions are necessary.

Prehospital Care

- Patients with active seizures should be treated with airway management, high flow oxygen, supportive care, and anticonvulsants as necessary
- Patients who are postictal should receive supportive care, and antipyretics as appropriate.

Emergency Department Care:

- Patients presenting with status epilepticus should be treated with airway management and anticonvulsants as necessary
- Patients presenting with history and physical examination findings consistent with a simple febrile seizure should have frequent neurologic examinations to monitor mental status ▶

- Other causes of seizure should be ruled out
- The cause of the febrile illness should be sought and treated
- Antipyretics should be considered
- Parental anxiety needs to be addressed.

Further Inpatient Care

- The decision to admit should be individualized, but admission usually is not necessary
- Most patients should be observed in the ED until awake and alert
- Conditions requiring admission of the patient include the followings:
  - More than 1 seizure within 24 hours
  - Unstable clinical status
  - Lethargy beyond the postictal period
  - Uncertain home situation
  - Unclear follow-up care.

Further Outpatient Care

Medical reevaluation of discharged patients and parental education in a follow-up appointment within 24-48 hours should be arranged.

Medical Care

- Continuous therapy with phenobarbital or valproate decreases the occurrence of subsequent febrile seizures
  - Both therapies confer significant risks and potential adverse effects, whereas additional simple febrile seizures have no proven risk
  - These medications are not recommended, since the potential benefits do not outweigh the potential risks
- No evidence suggests that any therapy administered after a first simple seizure will reduce the risk of a subsequent afebrile seizure or the risk of recurrent afebrile seizures (ie, epilepsy)
- Oral diazepam can reduce the risk of subsequent febrile seizures. Because it is intermittent, this therapy probably has the fewest adverse effects. If preventing subsequent febrile seizures is essential, this would be the treatment of choice
- Although it does not prevent simple febrile seizures, antipyretic therapy is desirable for other reasons.

PROGNOSIS

- Prognosis for normal neurologic function is excellent
- About one third of children who experience a single simple febrile seizure will have another
- The lifetime rate of epilepsy in these children is slightly above that of the general population.

PATIENT EDUCATION

- Parents should be taught what to do if their child has another seizure
- The parent should be advised to call for assistance if the seizure lasts longer than 10 minutes or if the postictal period lasts longer than 30 minutes
- Parents should be counseled on the benign nature of febrile seizures.
- Parents should be reassured that simple febrile seizures do not lead to neurologic problems or developmental delay.

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Tazid® (Ceftazidime)

Ceftazidime is a bactericidal cephalosporin antibiotic, which is resistant to most beta-lactamase and is active against a wide range of Gram +ve and Gram -ve bacteria.

Composition

Tazid® (Ceftazidime) 250 mg IM/IV injection: Each vial contains Ceftazidime USP 250 mg as Ceftazidime pentahydrate. Each ampoule contains a solvent of 5 ml water for injection

Tazid® (Ceftazidime) 500 mg IM/IV injection: Each vial contains Ceftazidime USP 500 mg as Ceftazidime pentahydrate. Each ampoule contains a solvent of 5 ml water for injection

Tazid® (Ceftazidime) 1 gram IM/IV injection: Each vial contains Ceftazidime USP 1 gram as Ceftazidime pentahydrate. Each ampoule contains a solvent of 10 ml water for injection

Indication

Single infections, Mixed infections, Severe infections in general, Respiratory tract infections, Ear, nose and throat infections, Skin and soft tissue infections, Gastrointestinal, biliary and abdominal infections, Bone and joint infections, Dialysis: Infections associated with hemo and peritoneal dialysis and with continuous ambulatory peritoneal dialysis (CAPD).

Dosage & Administration

Ceftazidime is to be used by the parenteral route, the dosage depending upon the severity, sensitivity & type of infections and the age, weight & renal function of the patient.

Adults: The adult dosage range for ceftazidime is 1 to 6 gram per day 8 or 12 hourly (IM/IV) in the majority of infections, 1gram 8 hourly or 2 gram 12 hourly should be given. In urinary tract infections and many less serious infections, 500 mg or 1 gram 12 hourly is usually adequate. In severe infections, especially immunocompromised patients, including those with neutropenia, 2 gram 8 or 12 hourly should be administered.

When used as a prophylactic agent in prostatic surgery 1gram should be given at the induction of anesthesia. A second dose should be considered at the time of catheter removal.

Elderly: In view of the reduced clearance of Ceftazidime in acutely ill elderly patients, the daily dosage should not normally exceed 3 gram, especially in those over 80 years of age.

Infants and Children: The usual dosage range for children aged over two months is 30 to 100 mg/kg/day, given as two or three divided doses. Doses up to 150 mg/kg/day (maximum 6 gram daily) in three divided doses may be given to infected immunocompromised or fibrocystic children or children with meningitis.

Neonates and Children up to 2 months of age: The usual dosage range is 25 to 60 mg/kg/day as two divided doses.

Instruction for reconstitution

Vial size	Amount & diluent to be added	
	IM	IV
250 mg	1.0 ml	2.5 ml
250 mg	1.5 ml	5 ml
500 mg	3.0 ml	10.0 ml

Storage condition

Unreconstituted vials should be stored below 25˚C. Reconstituted solutions and dilutions are stable for up to 24h if stored between 2˚C and 8˚C and protected from light. Reconstituted solutions are light yellow to amber.

Contraindication: Ceftazidime is contraindicated in patients with known hypersensitivity to Cephalosporin antibiotics.

Pregnancy and Lactation: Category B

Side Effect: Clinical trial experience has shown that ceftazidime is generally well tolerated. Adverse reactions are infrequent and include: Local: phlebitis or thrombophlebitis with i.v. administration; pain and/or inflammation after i.m. injection.

Hypersensitivity: Urticarial rash, fever, pruritus, and very rarely angioedema and anaphylaxis (bronchospasm and/or hypotension). Gastrointestinal: diarrhea, nausea, vomiting, abdominal pain, and very rarely oral thrush or colitis. Other adverse events which may be related to ceftazidime therapy or of uncertain etiology include: Genito-urinary: candidiasis, vaginitis. Central nervous system: headache, dizziness, paraesthesia and bad taste.

How supplied

Tazid® (Ceftazidime) is supplied as a sterile powder in glass vials.

Tazid® (Ceftazidime) 250 mg IM/IV injection: Pack of 1 vial contains Ceftazidime USP 250 mg as Ceftazidime pentahydrate accompanied by a solvent ampoule of 5 ml water for injection & a 5 ml disposable syringe.

Tazid® (Ceftazidime) 500 mg IM/IV injection: Pack of 1 vial contains Ceftazidime USP 500 mg as Ceftazidime pentahydrate accompanied by a solvent ampoule of 5 ml water for injection & a 5 ml disposable syringe.

Tazid® (Ceftazidime) 1 gram IM/IV injection: Pack of 1 vial contains Ceftazidime USP 1gram as Ceftazidime pentahydrate accompanied by a solvent ampoule of 10 ml water for injection & a 10 ml disposable syringe.

Correct answers of the 'Test Yourself - 11'

1. a & d **2.** c & d **3.** b **4.** b, c & d **5.** a **6.** b & c

The following are the 10 winners of the "Test Yourself -11"; they have been selected through lottery.

Congratulations from "the SQUARE" Editorial Board

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MBBS
MO, Adhunik Sadar Hospital
Kishorganj

Soon our officials will be visiting you with a token of our appreciation

Test Yourself — 12

1. All the followings are false except:
- a. Neonatal sepsis can be only caused by bacterial, parasitic or viral pathogens.
- b. Premature infant is a major risk factor in neonatal sepsis.
- c. Hypoxia, splenomegaly, hypotension, irritability are signs of neonatal sepsis.
- d. Hepatitis, HIV, candida species, rubella have been implicated in neonatal infection.

2. All the followings are true except:
- a. A child with symptomatic febrile seizure has a preexisting neurological abnormality.
- b. Children with simple febrile seizures are at an increased risk of epilepsy.
- c. About 2/3rd of all children with the first febrile seizure experience recurrent seizures.
- d. The seizure is described as either a generalized tonic or a generalized tonic-clonic.

3. All the followings are correct in case of bronchiolitis except:
- a. RSV subtype A causes most severe infections.
- b. RSV causes wheezing respiratory infections of 44% of cases in children older than two years.
- c. Boys are affected 1.7 times more than girls.
- d. Adenoviruses are associated with short-term complications.

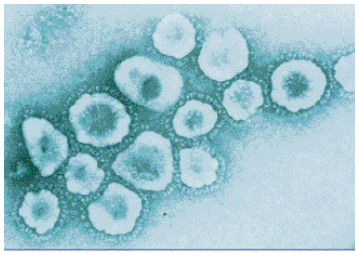
4. All the followings are true in neonatal sepsis except:
- a. Cephalosporins are attractive in the treatment of nosocomial infections.
- b. Gentamycin level must be obtained after second or third dose of treatment.
- c. Granulocyte colony stimulating factor, intravenous immunoglobulin are commonly used to treat neonatal sepsis.
- d. Renal failure, myocardial dysfunction can be associated with neonatal bacteremia.

5. The followings are the true for Tazid® except:
- a. It is generally indicated in single, mixed and severe infections.
- b. The usual pediatric dose over two months is 30mg to 150mg/kg/day.
- c. In acutely ill elderly patient the daily dose of Tazid® should not exceed 3gm.
- d. The dosage of Tazid® in neonates and children up-to two months of age is 20mg to 60mg/kg/day

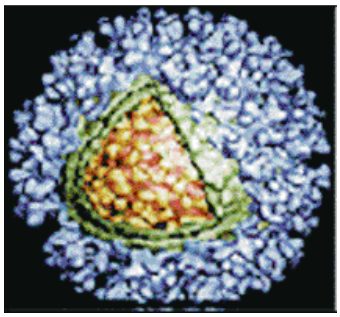
6. The followings are the correct treatment of bronchiolitis except:
- a. Sedative should be avoided whenever possible.
- b. Ribavirin is indicated over two years of age.
- c. Antibiotic has always a therapeutic value.
- d. Corticosteroids are not beneficial rather may be harmful.

Updates on SARS

Severe acute respiratory syndrome (SARS) is an acute respiratory infection that has recently been reported in South-East region of Asia, including China, Singapore, Hong Kong; North America, and Europe. It is a form of atypical pneumonia caused by virus. Scientists at CDC (Centers for Disease Control and Prevention) and other laboratories have detected a previously unrecognized coronavirus in patients with SARS. Early in the SARS investigation, researchers from several laboratories participating in the WHO network have reported the identification of a paramyxovirus in clinical specimens from SARS patients. Later findings indicated that a new coronavirus is the most likely cause of SARS. Latest research by the University of Hong Kong suggests that a coronavirus (SARS Co-V) is the primary cause of the disease. The disease is not fatal in most of the cases. With early detection and treatment there is a high chance of recovery. Severe cases are usually seen in patients with pre-existing health problems or who seek treatment at a late stage.



Coronavirus



Coronavirus

EPIDEMIOLOGIC CRITERIA

- Travel (including transit in an airport) within 10 days of onset of symptoms to an area with current or recently documented or suspected community transmission of SARS, or
- Close contact within 10 days of onset of symptoms with a person known or suspected to have SARS infection

Incubation period: typically 2 - 7 days.

Transmission

Respiratory droplets and direct contact with a patient's secretions transmit SARS.

CLINICAL CRITERIA

- Asymptomatic or mild respiratory illness
- Moderate respiratory illness: Temperature of >100.4˚ F (>38˚ C), and one or more clinical findings of respiratory illness (e.g., cough, shortness of breath, difficulty breathing, or hypoxia)
- Severe respiratory illness: Temperature of >100.4˚ F (>38˚ C), and one or more clinical findings of respiratory illness (e.g., cough, shortness of breath, difficulty breathing, or hypoxia), and radiographic evidence of pneumonia, or respiratory distress syndrome, or autopsy findings consistent with pneumonia or respiratory distress syndrome without an identifiable cause.

INVESTIGATIONS

X-ray chest suggestive of pneumonia.

Confirmed

- Detection of antibody to SARS-CoV in specimens (serum, stool or nasal-secretions) obtained during acute illness or >21 days after illness onset, by serological test for coronavirus can be performed by indirect fluorescent antibody or enzyme-linked immunosorbent assays (ELISA), or
- Detection of SARS-CoV RNA by RT-PCR (Reverse transcriptase polymerase chain reaction) confirmed by a second PCR assay, by using a second aliquot of the specimen and a different set of PCR primers, or
- Isolation of SARS-CoV.

Negative

- Absence of antibody to SARS-CoV in convalescent serum obtained >21 days after symptom onset.

Undetermined

- Laboratory testing either not performed or incomplete.

TREATMENT

Treatment with Ribavirin and steroid show good result in SARS. Other treatment methods are also being developed and tested. In 10 percent to 20 percent of cases, patients will require mechanical ventilation.

PREVENTION

Vaccine is not yet available. The following measures will help to control the disease:

- Maintenance of good personal hygiene: nose and mouth should be covered with a tissue when sneezing ▶

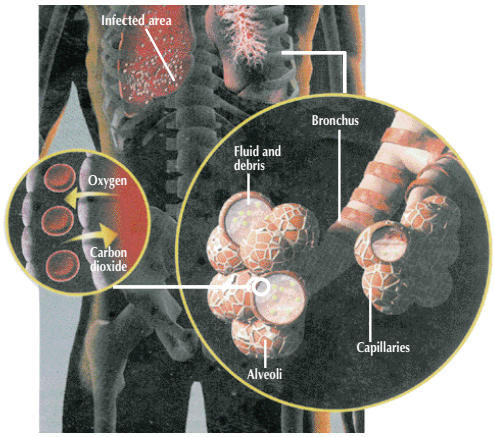
or coughing, and hands must be washed immediately afterwards with liquid soap
- ❑ Hands should be dried with a disposable towel or a hand dryer
- ❑ Healthy lifestyle must be developed by maintaining proper diet, regular exercise, adequate rest and avoidance of smoking
- ❑ Home and office should be well ventilated
- ❑ People with respiratory tract infections, or those caring for them, should wear a face mask
- ❑ Prompt treatment and advice should be needed.

Preventive Measures for Management of Public Places

- ❑ The venue should be well ventilated
- ❑ Air-conditioning systems must be well maintained and cleaned regularly
- ❑ Properly operated toilet facilities
- ❑ Liquid soap, disposable towels and hand dryers should be provided in toilets
- ❑ Commonly-used facilities, including telephones should be cleaned and disinfected at least once a day by using a diluted solution of household bleach (1part bleach: 99 part water) and rewiped with a towel soaked in clean water
- ❑ Vomitus should be cleared by diluted solution of household bleach (1 part bleach: 49 parts water).

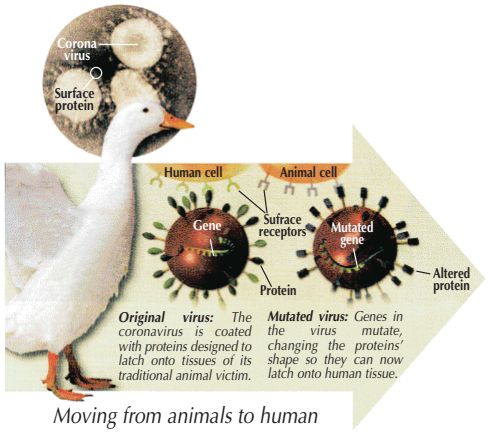
When a family member is affected

- ❑ People should avoid visiting patients with atypical pneumonia.



The SARS virus enters the body through tiny droplets expelled by SARS carriers

- ❑ People who have close contact with patients suffering from the disease should:
- Observe quarantine regulations. The patient will be required to stop work, stay at home for 10 days
- Good personal hygiene should be maintained and wearing a face mask is essential when people leave home



Moving from animals to human

- People who have had contact with an infected person, wear a face mask for at least 10 days and seek medical advice
- At home, toys and furniture should be cleaned properly (by using a solution of 1 part bleach : 49 parts water)
- Seek early medical advice if feeling unwell.

RELAPSE

The natural course of the illness is not being well established. Centre for Disease Control and Prevention (CDC) and other scientists are trying to learn about the natural history of SARS.

SARS Update *Associated Press*

June 17, 2003 01:09:50 AM
SARS has killed at least 800 people and infected more than 8,400 in two dozen countries worldwide, but in Asia - the hardest-hit region -declining numbers of deaths and new cases are evidence the crisis is easing.

Reference:

1. CDC (Centers for Disease Control and Prevention)
2. Time; May 05, 2003
3. Newsweek; May 05, 2003

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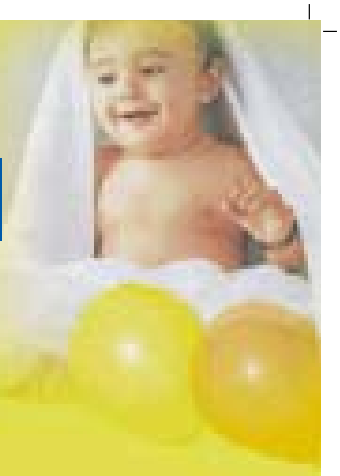

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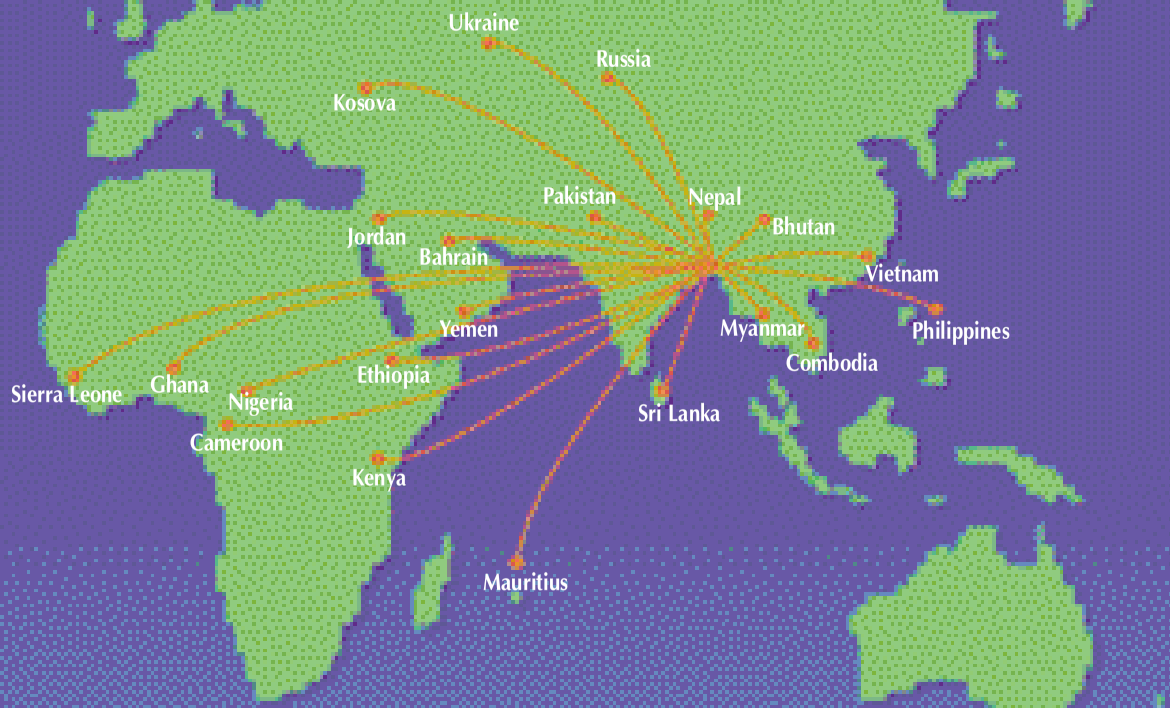

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