Primary Health Care Initiatives (PHCI) Project
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Abt. Associates Inc.

FEVER in a CHILD

LEARNING OBJECTIVES

- Understand the definition and pathogenesis of fever
- Develop an effective plan to identify the cause of fever
- Describe the clinical management of fever in special group
- Communication to the patient and the family regarding the understanding, control and treatment of fever
- Know indications for referral of febrile child

TEACHING STRATEGIES

- Review the proper measurement of temperature and the mistakes that can occur.
- Use lecture or informal presentation for material
- Use small group discussion or role play for prevention, counseling and patient education issues.

MATERIALS AND EQUIPMENT NEEDED:

- Oral and rectal types of thermometers for demonstration
- White board or flip chart and markers for summarizing major points.

LEARNING POINTS

- Definition and pathogenesis of fever
  - Definition –Core body (rectal) temperature >38, or oral temperature >37.5
  - Caused by changes in "set-point" of hypothalamus to higher temperature
    - Bacteria, viruses, toxins, or other agents are phagocytosed by leukocytes
    - Interleukin-1 and other chemical mediators (endogenous pyrogens) are produced and activate the production of prostaglandins
    - Pyrogens and prostaglandins act on the thermoregulatory mechanism in the hypothalamus and upwardly readjust the body's thermostat
    - Raising the hypothalamic set-point initiates the process of heat production and conservation by:
      - increasing metabolism and glucose production
      - causing peripheral vasoconstriction in arms and legs, central vasodilatation in major organs
      - occasionally causes shivering which increases heat production from the muscles
  - Recent studies show fever helps to boost immune system response – helps to fight viral or bacterial infections
  - Fever, even fevers of up to 40.5, do not cause brain damage, and do not harm the child

- Must distinguish fever (altered hypothalamic set-point) from hyperthermia (elevated temperature)
    - Hyperthermia (apparent fever) can be caused by:
        - Hot environment, such as heat exhaustion
        - Overwrapping of children, especially infants
        - Hot drinks immediately prior to taking temperature
        - Endocrine abnormality such as hyperthyroidism (increased metabolism)

- Fever and febrile convulsions
    - Approximately 3% of all children < age 6 may have brief convulsion associated with fever
    - Clinical characteristics:
        - Usually occurs at beginning of fever, often before parent aware that child has a fever
        - Usually brief, less than 30 seconds
        - Usually a generalized convulsion, occasionally may be repeated or focal
        - Generally no evidence of toxicity, stiff neck or other signs of meningitis
        - The tendency to febrile convulsions should disappear by age 6
    - First febrile seizure (especially in child less than 3 years of age) should generally be investigated to rule out possibility of meningitis or encephalitis or tumor
    - Recent studies show that children with febrile convulsions have no abnormalities in development, school performance, IQ, or other measures
    - Known febrile convulsions do not need anti-convulsant treatment – attempted treatment with anti-convulsants is usually not effective
    - MOST IMPORTANT – vigorous treatment of a high fever may not prevent febrile seizures!
    - Parents of children with febrile seizures should be reassured that this does not cause harm or indicate severe illness.

- Clinical evaluation of fever
    - Important elements of history
        1. Inquire about onset, duration, and pattern of fever
        2. Inquire about associated symptoms such as changes in activity, appetite, chills, headache, nasal congestion, earache, sore throat, cough, abdominal pain, vomiting, diarrhoea, painful urination
        3. Explore hydration status by asking about amount of fluid intake and frequency and amount of fluid output
        4. Ask about conscious level of patient
        5. Explore possibilities of heat illness (heat stroke) or from other types of environmental exposure
        6. Ask whether patient started any new medications or had a recent immunisation
        7. Ask whether other household members are ill or have fevers
        8. Inquire about last dosage of an antipyretic and other self-treatment measures

9. Past medical history should include a list of medications currently being used, discussion of previous illnesses and diseases, particularly any cardiac or chronically debilitating disorders
10. A complete review of systems may be needed to uncover source of fever and to determine severity of debility due to elevated body temperature

- Important elements of physical examination
    1. Assess vital signs
    2. Observe general appearance in both adults and children looking for subtle signs such as changes in alertness
    3. Observe skin for color, rashes, patechiae or purpura
    4. Assess for signs of dehydration such as skin turgor and capillary refill
    5. Assess neck for rigidity
    6. Check for lymphadenopathy
    7. Assess for swollen joints
    8. Often need to do complete physical examination to find localized infection such as otitis media, pharyngitis, sinusitis, meningitis, cervical adenitis, or pneumonia

- Appropriate Laboratory investigations
    - In the majority of cases, the history and physical examination will uncover likely causes of the fever and suggest selective diagnostic tests, such as a throat culture, urinalysis, or chest X-ray
    - If no apparent cause of fever is found, especially in a young child, may consider the following tests for further diagnosis:
        - Blood count (WBC and differential)
        - Urinalysis
        - Liver function studies (SGOT, bilirubin, etc.)
        - Test for mononucleosis
        - Brucella and Salmonella antibody titers
        - Chest X-ray
    - Fevers without a known cause which last longer than 10 days are called fevers of unknown origin (FUO) and require specialist consultation and an extensive diagnostic evaluation.

- Management of fever in special group of children
    - Newborn and Infant < 3months
        - Must consider sepsis, meningitis, urinary tract infection, pneumonia
        - Should generally be hospitalized for evaluation, observation, and antibiotics until definitive cause found
    - Splenectomized patients
        - Very susceptible to certain bacterial infections, especially streptococcus pneumoniae
        - Should receive high doses of penicillin and be referred to hospital if any suspicion of pneumococcal infection
        - Should receive pneumococcal vaccine following splenectomy if at all possible
    - Immune compromised child

        - Very susceptible to generalized sepsis
        - Should receive prophylactic antibiotics if feverish, or in any situation where bacterial infection is a risk (influenza, severe URI, surgical procedures, dental extractions, etc.)
    - Cystic Fibrosis patients
        - Very susceptible to respiratory infections
        - Should receive prophylactic antibiotics with any moderately severe respiratory infection
        - Consider referral to specialist if respiratory infection not resolving

- **Treatment**
    - Antipyretics – used only to help child feel more comfortable
        - Paracetamol 10-15mg/kg/dose every 4-6 hours
        - Aspirin 10-15mg/kg/dose every 4-6 hours for adults only (generally should not be given to children because of slight risk of Reye's Syndrome)
        - Ibuprofen 2.5 10mg/kg/dose 6-8 hours
        - Give more fluid to avoid dehydration
        - Take off excessive clothes
        - Do not overheat the room
        - Sponging with water at room temperature may may child more comfortable
        - Identify and treat the underlying cause of fever

HEALTH EDUCATION AND PREVENTION

- MOST IMPORTANT – Fever helps to fight infection! Fever does not damage the child, cause brain damage or other problems!
- Teach when to administer antipyretics and the correct time and dose, to make child more comfortable
- Instruct to ovoid overdressing.
- Encourage giving of extra fluids to prevent dehydration from fever
- What to do in case of child with febrile seizures

CASE STUDY

Name Fatima
Sex Female
Age 3 months

Present History: This infant was doing well until 2 days ago started to be warm. She has runny nose with mild cough.
Physical Exam: R.Rate 30/min pulse 120/min Temp. 38.7 C rectally. Congested throat and normal ears. Clear chest. The rest of examination was normal apart from mild irritability.

Topics of discussion regarding case study:

1. What important additional elements of the history should be asked?
2. What is the most probable diagnosis?
3. What important element in the examination should be mentioned?

4. What investigations might be helpful?
5. What is your management for this case?

CRITICAL ELEMENTS FOR REFERRAL

- Presence of signs of meningitis.
- Patients with altered level of consciousness
- Fever lasts more than 5-7 days
- Toxic looking patients
- Fever in special group children

CRITICAL ELEMENTS OF EVALUATION FOR COMPETENCE

- Proper evaluation and examination of a child with fever
- Appropriate non-pharmacologic and pharmacologic management of fever
- Appropriate patient education about fever and its management plan.
- Knowledge of need for referral and hospital admission