**Exam ticket №7**

1. Breastfeeding.

2. Idiopathic thrombocytopenic purpura in children. Etiology, pathogenesis, classification, clinical picture, diagnostics, differential diagnosis, treatment, prevention.

Answers:

**1.** Adequate nutrition during infancy and early childhood is essential to ensure the growth, health,and development of children to their full potential.

Breastfeeding confers short-term and long-term benefits on both child and mother, including helping to protect children against a variety of acute and chronic disorders. The long-term disadvantages of not breastfeeding are increasingly recognized as important.

Breast-milk composition. Breast milk contains all the nutrients that an infant needs in the first 6 months of life, including fat, carbohydrates, proteins, vitamins, minerals and water. It is easily digested and efficiently used. Breast milk also contains bioactive factors that augment the infant’s immature immune system, providing protection against infection, and other factors that help digestion and absorption of nutrients.

Fats. Breast milk contains about 3.5 g of fat per 100 ml of milk, which provides about one half of the energy content of the milk. The fat is secreted in small droplets, and the amount increases as the feed progresses. As a result, the hindmilk secreted towards the end of a feed is rich in fat and looks creamy white, while the foremilk at the beginning of a feed contains less fat and looks somewhat bluish-grey in colour. Breast-milk fat contains long chain polyunsaturated fatty acids (docosahexaenoic acid or DHA, and arachidonic acid or ARA) that are not available in other milks. These fatty acids are important for the neurological development of a child. DHA and ARA are added to some varieties of infant formula, but this does not confer any advantage over breast milk, and may not be as effective as those in breast milk.

Carbohydrates. The main carbohydrate is the special milk sugar lactose, a disaccharide. Breast milk contains about 7 g lactose per 100 ml, which is more than in most other milks, and is another important source of energy. Another kind of carbohydrate present in breast milk is oligosaccharides, or sugar chains, which provide important protection against infection.

Protein. Breast milk protein differs in both quantity and quality from animal milks, and it contains a balance of amino acids which makes it much more suitable for a baby. The concentration of protein in breast milk (0.9 g per 100 ml) is lower than in animal milks. The much higher protein in animal milks can overload the infant’s immature kidneys with waste nitrogen products. Breast milk contains less of the protein casein, and this casein in breast milk has a different molecular structure. It forms much softer, more easily-digested curds than that in other milks. Among the whey, or soluble proteins, human milk contains more alpha-lactalbumin; cow milk contains betalactoglobulin, which is absent from human milk and to which infants can become intolerant.

Vitamins and minerals. Breast milk normally contains sufficient vitamins for an infant, unless the mother herself is deficient. The exception is vitamin D. The infant needs exposure to sunlight to generate endogenous vitamin D – or, if this is not possible, a supplement. The minerals iron and zinc are present in relatively low concentration, but their bioavailability and absorption is high. Provided that maternal iron status is adequate, term infants are born with a store of iron to supply their needs; only infants born with low birth weight may need supplements before 6 months. Delaying clamping of the cord until pulsations have stopped (approximately 3 minutes) has been shown to improve infants’ iron status during the first 6 months of life.

Anti-infective factors. Breast milk contains many factors that help to protect an infant against infection including: immunoglobulin, principally secretory immunoglobulin A (sIgA), which coats the intestinal mucosa and prevents bacteria from entering the cells; white blood cells which can kill micro-organisms; whey proteins (lysozyme and lactoferrin) which can kill bacteria, viruses and fungi; oligosacccharides which prevent bacteria from attaching to mucosal surfaces.

The protection provided by these factors is uniquely valuable for an infant. First, they protect without causing the effects of inflammation, such as fever, which can be dangerous for a young infant. Second, sIgA contains antibodies formed in the mother’s body against the bacteria in her gut, and against infections that she has encountered, so they protect against bacteria that are particularly likely to be in the baby’s environment. Other bioactive factors Bile-salt stimulated lipase facilitates the complete digestion of fat once the milk has reached the small intestine. Fat in artificial milks is less completely digested. Epidermal growth factor stimulates maturation of the lining of the infant’s intestine, so that it is better able to digest and absorb nutrients, and is less easily infected or sensitised to foreign proteins. It has been suggested that other growth factors present in human milk target the development and maturation of nerves and retina.

**2.** ITP is an acquired hematological disorder that is developed secondary to the production of auto-antibodies against platelets leading to isolated thrombocytopenia, in the absence of other causes of thrombocytopenia such as drugs, infections, malignancy, or other autoimmune diseases.

Classification:

Newly diagnosed ITP (within 3 months from diagnosis), persistent ITP (between 3 to 12 months from diagnosis; this includes patients that do not reach spontaneous remission or do not maintain complete response off therapy), and chronic ITP (lasting for more than 12 months).

Severe ITP is defined as presence of bleeding symptoms at presentation that mandate treatment or occurrence of new bleeding requiring new therapies like platelet enhancing agents or increasing the doses of previously used medication.

Clinical presentation of childhood ITP

ITP in children typically affects a previously healthy young child who is between two to seven years of age. Males and females are equally affected. However, recent studies reported a higher male/female ratio during infancy with a decreasing trend toward older age. The disease onset is abrupt with bruises and petechial rashes affecting almost all patients. Epistaxis may occur in about one third of patients and hematuria is uncommon. In about two thirds of patients, the disease onset is preceded by an infection in the previous few days to several weeks. The infection is most often an upper respiratory tract viral infection and the interval between the infection and the ITP onset onset is in the range of two weeks. Clinical examination reveals a healthy child who only has bruises and petechiae as manifestation of the low platelet count. There should be no organomegally and no lymphadenopathy. In very rare occasions, the tip of the spleen may be felt. The diagnosis of ITP in children is essentially one of exclusion. The CBC shows isolated thrombocytopenia with normal WBC and normal Hb levels. The peripheral blood smear shows no evidence of abnormal cells.

Differential diagnosis of ITP in children

The diagnosis of ITP in children is essentially one of exclusion. In order to differentiate ITP from other conditions, medical history should include type and severity of bleeding, systemic symptoms, history of respiratory infections, recent live viral vaccine, medications, presence of bone pain, and family history of bleeding disorders. Clinical examination should include observation for any dysmorphic features, especially skeletal anomalies, and the presence or absence of hepatosplenomegaly and/ or lymphadenopathy.

Laboratory investigations in ITP

1. Complete blood count and peripheral blood smear are essential to establish the diagnosis of ITP. CBC shows isolated thrombocytopenia with normal WBC and normal Hb levels. Anaemia is present only if there is severe bleeding.

2. Bone marrow aspiration (BMA) is not required to establish the diagnosis of ITP and also is not necessary prior to steroid treatment in typical cases of ITP. However, BMA should be done if there is bone pain, lymphadenopathy, hepatosplenomegaly, anaemia that is not explained by blood loss, or abnormally high or low WBC.

3. Antiplatelet antibodies measurement does not assist in the diagnosis of ITP and therefore should not be routinely performed.

4. Coagulation screening does not help in the diagnosis of ITP, and should be done only if infection or inherited bleeding disorders are considered.

5. Test for Antinuclear Antibodies (ANA) could be performed in older children with ITP or those who have a chronic form of the disease. ANA testing is not required in children newly diagnosed with primary ITP.

6. Immunoglobulin level should be done only if common variable immune deficiency is suspected.

7. Thrombopoietin level does not help in the diagnosis of ITP and therefore should not be routinely performed

Management of childhood ITP

The rationale for treating children with ITP is to increase platelet count to a safer level and prevent serious bleeding, mainly intracranial haemorrhage

The majority of the existing clinical practice guidelines for the treatment of ITP, recommend not to treat the platelet count alone, and to follow “watch and wait policy” especially if the child has bruising, scattered purpura and petechiae only. However, if the child has more bleeding symptoms, especially mucous membrane bleeding, and, in addition, if the platelet count is less than 10,000 then treatment is recommended.

The therapeutic agents used for the treatment of ITP are generally divided into three types based on the mechanism of action:

1. Inhibit antibody production.

2. Inhibit Fc& receptors (Fc& R) function.

3. Stimulate platelet production.

There are three main options for the initial pharmacologic treatment of ITP:

1. Corticosteroids

2. Intra venous immunoglobulin (IVIG)

3. Anti-D immunoglobulin.

Treatment of persistent ITP, chronic ITP and non-responders:

In these patients, and in the presence of bleeding symptoms, the use of second line therapy is needed:

1. Rituximab:

Rituximab is a chimeric anti-CD20 monoclonal antibody consisting of human immunoglobulin constant region Fc and murine variable region Fb.

2. High dose dexamethasone:

3. Thrombopoietin (TPO) receptor agonists: These are new agents that stimulate platelet production by a mechanism similar to endogenous TPO. Two agents (Romiplostim and Eltrombopag) are approved for the use in adult patients with ITP, in Europe, USA, Japan and other countries

4. Splenectomy for persistent, or chronic ITP, or ITP not responding to therapy:

**Case 2. Feedinf task**

Prescribe feeding for 1 day for 2-months-old child. Birth weight 3400g. Breastfeeding.

**Answer:**

Present body weight is 3400+600+800=4800 g.

Volume of food for 1 day is 4800/6 =800ml, volume for 1 feeding: 800/6 = 135ml

|  |  |  |
| --- | --- | --- |
| Time | **Food** | Volume, ml |
| 6 a.m. | Breast milk | 135 |
| 9.30 a.m. | Breast milk | 135 |
| 1 p.m. | Breast milk | 135 |
| 4. 30 p.m. | Breast milk | 135 |
| 8 p.m. | Breast milk | 135 |
| 11.30 p.m. | Breast milk | 135 |

**Mark** if all the calculations were made correctly and the feeding scheme was observed according to the “National Program for Optimizing the Nutrition of a First Year Baby” - 100 points, without taking into account the age of the child and there is no timely introduction of complementary foods, or vice versa - <70 points (%,), the error in the calculations is 70–79 points, there is no functional approach to the appointment of complementary foods or mixtures - 80–89 points.

**Case 1.**

A 10-year-old boy has been having bellyaches for about 2 years. They

occur at night as well as during the day. Occasionally, he vomits after the

onset of pain. Occult blood has been found in his stool. His father also gets

frequent stomachaches.

1. The most likely diagnosis

2. Treatment

**Answer**

The presence of nocturnal abdominal pain and gastrointestinal bleeding and a positive family history support a diagnosis of peptic ulcer disease. Pain is the most common symptom. Symptoms often persist for several years before diagnosis. The increased incidence of peptic ulcer disease in families (25 to 50%) and concordance in monozygotic twins suggest a genetic basis for the disease. Antibiotic treatment for Helicobacter pylori in patients not responding to conventional therapy can cure this disease in some patients. Appendicitis and intussusception are acute events. Pinworms produce perianal pruritus but do not commonly cause abdominal pain or other serious problems. Meckel diverticulum

causes painless rectal bleeding, usually during early childhood.

**Analysis**

**CBC:** Hb - 128 g/l, RBC - 4.4\*1012/l, PLT – 290\*109/l, WBC - 7.6\*109/l, stab neutrophils - 3%, segmented neutrophils - 49%, eos - 3%, lymph - 40%, mon - 5%, ESR - 8 mm/h.

**Answer:** normal analysis