Group A Streptococcal Infection - Biochemical and Pharmacological Aspects

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The medicine of the last years is evidence-based - most of the theoretical information that has occurred in the past 10 years is already out of date.The Axioma of Classical Pediatrics - Any Group A Haemolytic Beta Streptococcus must be treated with Penicillin G is no longer relevant The results of a study at the Hospital Philanthropy from Craiova are not at all surprising, overlapped with those found in medical practice.Age entails moving the diagnosis to the baby, sensitivity to penicillin occurs in only ¼ of children, microbial resistance to the antibiotic is common in many antibiotics.

Keywords: streptococcus, children, antibiotics

Streptococcus hemolytic beta-Streptococcus A is a round oval gram positive coccus, disposed in pairs of chains, immobile, optionally anaerobic, catalase-negative, non-spore-forming. Some strains are encapsulated, the capsule being a marker of virulence.

Blood haemolysis by PYR assay identifies pyrrolidonyl amidase synthesis; Group A streptococcal proliferation is inhibited by bacitracin; based on carbohydrate composition of bacterial antigens (Lancerfield) group B hemolytic group A, streptolysins causing hemolysis; in the wall there is M protein with antiphagocytic role.

It contains extracellular enzymes and toxins: streptolysin O, S, PSE (pyrogen streptococcal exotoxins) type A, B, C, which produces scarlatin, exanthema, enanthem, septic shock; superantigens, streptokinases, hyaluronidases [1].

Group and beta-hemolytic streptococcus infection affects 30-40% of children with pharyngitis [2,3].

The source of infection is the sick man or the asymptomatic chronic pharyngeal carriers, through Pflügge drops or direct contact because the bacteria does not resist the external environment.

Experimental part

Methods and materials

Streptococcal pathology is extremely varied: pharyngitis, scarlet fever, impetigo, erizipel, cellulitis, necrotizing fasciitis, angina, rhinitis, sinusitis, meningitis, malignant endocarditis, toxico-septic syndrome[4,5].

The most serious complication: rheumatic fever, carditis, glomerulonephritis.

The most common diagnosis is acute pharyngitis, supported by anamnesis, clinical examination, laboratory test, bacteriological test (which states the etiology) [6-10].

Bacteriological test

Tests to confirm bacterial infection:

-bacitracin test,
-latex agglutination test
-coaglutinations ELISA,
-blood agar culture (hemolysis, S, A colonies),
-Quellung reaction,
-PYR test
-ASLO for streptococcus pyogenes, antibody tests for other antigens (streptokinase, hyaluronidase, anti-carbohydrate) [11-13].

There are classical *axioms*. Are they up to date? The results speak for themselves:

-The drug of chose is penicillin G or V and, in those allergic to erythromycin or oxacillin.

-No antibiotic for group A haemolytic beta streptococcus is performed.

-The infection particularly affects children over 3 years, not infants [14,15].

History: Penicillin's microbial resistance began with the invention of Penicillin in 1928 by Alexander Fleming, which represented a big step in microbial therapy.

The explanation was given in 1885 by Victor Babes, who observed the inhibitory action of substances elaborate by microorganisms.

In 1930, the first cases of Penicillin microbial resistance were already observed [16].

We selected a group of 174 patients by group A haemolytic beta-streptococcal confirmed by exudate from a total of 1273 hospitalized children over a whole year.

Cold months confirm the incidence of bacterial infection.

Findings were stratified by age group: 14 - infants, 10 between 1-3 years, 24 over 7 years, between 3-7 years 126 cases. 51 antibiograms were performed.

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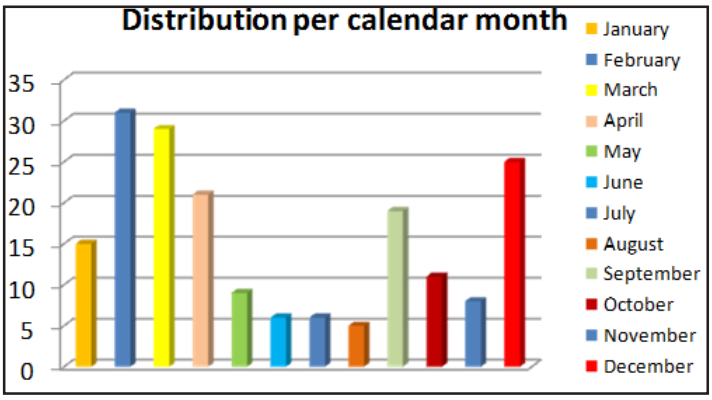

Fig 1. Bacterial infections distribution per calendar month

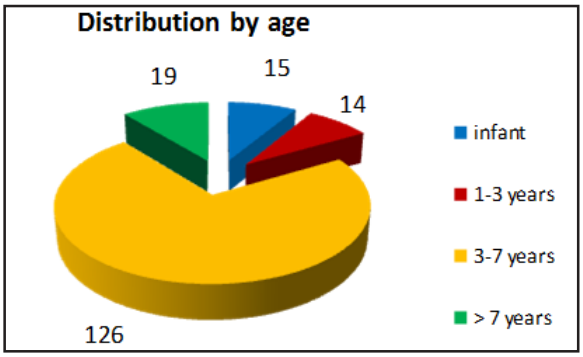

Fig 2. Age stratification

Results and discussions

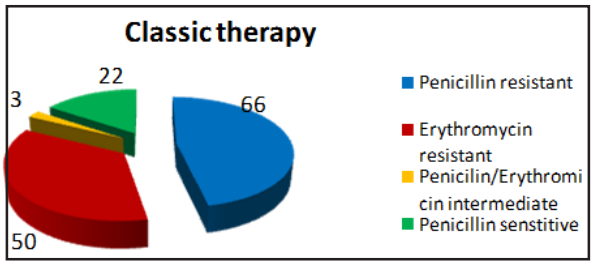

Fig 3. Classic therapy

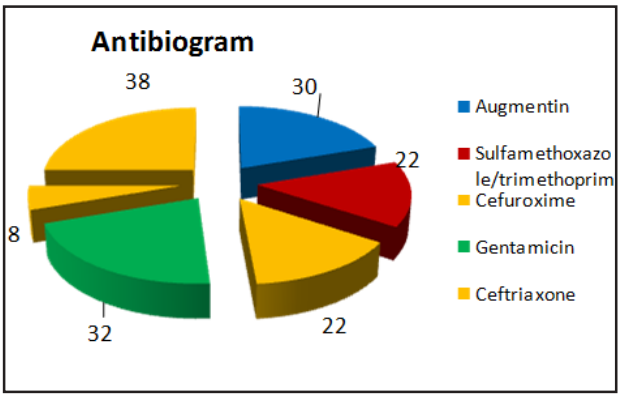

Fig 4. The results of antibiogram

Most bacteria have proven resistant to *classical* therapy with Penicillin or Erythromycin.

Some explanations for the occurrence of the disease at infancy may be:

-Close intimate intra-family contact

-*Predigestion* of food under the action of salivary amylase from the mother, still practiced in our country

-Insufficient sterilization of the teat, pacifier, as well as *wetting* it before it is given to the baby [17-21].

Possible explanations and theories:

- *internalization* in the tonsillar crypt;

-different response *in vivo - in vitro;*

-abuse of antibiotics at younger age;

-the local floral defenses destroyed;

-multiple hospital admission for other affections;

-alginate theory, possibly as in pseudomonas defense in mucoviscidosis;

-double etiology of angina - streptococcus and staphylococcus [22,23].

Conclusions

The future is evidence-based medicine where YES and NOT are relative, not absolute.

Axioms become theorems that will need to be demonstrated; otherwise the *proof* of the time drops.

Polypragmasia forces accelerated entry into a new age, where new bactericidal drugs with a very wide spectrum will be invented, in which the microbiota will have to be strengthened and *blossomed* where immune barriers will need to be stimulated efficiently and quickly.

There is no disease but the patient is a dictum of old pediatrics strengthens by the present times

The well-known semiological picture changes rapidly for various illnesses and the tendency of establishing protocols is increasing.

The antibiotic should be a mandatory step to indicate the sensitivity of any germ.

Questions remain to be answered:

The benefit could be for the doctor, protected by the protocol, but what about complicated affections?

How do we effectively combine different protocols?

Can the protocol be assimilated to an axiom but do their axioms have their place in pediatrics?

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