NEISSERIA MENINGITIDIS INFECTION (REPORT)

L.*Păun*, Olga *Dorobăț*, E.*Ceauşu*

Clinic of Infectious and Tropical Diseases,
University of Medicine and Pharmacy, Bucharest

Neisseria meningitidis (N.m.) is a Gram negative, in diplo organism and has a specific microscopic character with flat adjacent surface. Many strains of N.m. have capsules and pili. There are three antigenic systems, genetic independent: capsular polysaccaride, membranal proteins and lypopolysaccaride. Based on these antigenic systems, there were established serogroups (A, B, C, D, X, Y, Z, W135, 29, E, H, I, K, L), serotypes, subtypes and immunotypes.

N.m. is sensitive to betalactamine, tetracycline, cloramphenicol, aminoglycoside, rifampicine and quinolone. There were observed a relative resistance to sufamides and cotrimoxasole. There were observed a low sensitivity to penicillin, in some countries (Spain, Great Britain, Greece etc.). Host infection depends on the properties of the organism (pili, capsule, lypopolysaccaride, external membrans proteins etc.) and its susceptibility. Children's receptivity can be higher because of their lack of bacterial antibodies. For adults, there are multitude of other factors.

After the contact with the nasopharigeal tissue, the meningococcus starts to multiply and produces lacal injuries, penetrating throw endocitosis in the subepitelial tissue. Reaching the blood stream, the capsular meningococcus survives, penetrates the hematoencephalic limit and finaly involves the CFS. The self - defence system being inadequate at this level, N.m. multiples and starts the diapedesis of the neutrophiles. The deterioration of the permeability conducts to a vasogen and citotoxic cerebral edema, followed of reversible or irreversible neuronal damages.

In the environement, the source of infection is the human body (ill or only carrier). The asimptomatic carriers represent around 5% in the general population (2-30%). The morbidity of meningococcic meningitis fluctuates from 1-3/100000 in Europe and North America to 12/100000 in the developing countries and reaches 25/100000 in some african countries.

At variable periods from 5-10 years, in the temperate climate (including Romania), there are long time outbreaks of meningitis with N.m. 50-70% from the affected individuals are children, teenagers and young adults. In the tropical countries, especially those from the "meningitic african belt", the outbreaks are frequent, severe and difficult to prevent or to handle (during such periods, the morbidity raised from 10-25/100000 to 250-925/100000). Starting with the '70th, there were observed a high tendince for the extension of the "belt" to North (Marocco, Tunis) and to ecuatorial and australian Africa, as forming a "second belt".

The invasive strains of N.m. are represented from nine serogroups but 90% from them are produced by three types: A, B and C. The serogroups that produce the disease are different by geografic areas and inquired period. The last 25 years, the cases registered in Europe,were produced by the serogroup B (in Western countries) and by serogroup A in East Europe. Usually the serogroup C was observed in the same areas where the serogroup B was found. Until 1990, the dominant serogroup for Romania was the serogroup A. It produced the great outbreak of meningococcal meningitis between 1986-1988 (it was registrated an unprecedent outbreak seen before in our country - 11,4/100000). Starting from 1991, the characteristic serogroup is the serogroup B and its influence is more negative - more severe diseases and more death.

The clinic of meningococcal infection has multiple aspects.Byside the purpura fulminans and meningitis, the most dramatic aspects of this infection, are other types of illness: pharingitis, exantema, pneumonia, arthritis, pericarditis, miocarditis, endocarditis, peritonitis, conjunctivitis, iridocyclitis etc. Clinial manifestation induced by immune reactions are

frequent in meningococcal infection (antigen-antibody reaction). Usually, they appear after 10-14 days from the septicemic beginning of the diseases, even the antibacterial treatment was correctly and completly done. The clinical aspects are: fever (sometime the only manifestation of the disease, variable as duration and amplitude), arthritis, pericarditis, exantema (as we observed on a cohort of 664 cases).

The etiological treatment was modified during the years. At this moment, sulphamides have, only a historical interest. The penicillin and ampicillin yet extremelly effective on the most N.m. strains, are used very frequent. The cephalosporines of the third generation (especially ceftriaxone and ceftasidime) have a positive influence now and in future, because of in part or total resistance to penicilline of N.m. Comparing to the classic therapy, it has the advantage of a high concentration in CSF (2500 to 100000 times higher as the MIC of the germ). Cloramphenicol is used just in case of beta lactame allergy. The duration of the treatment is of 7 days. Similar results were obtained after shorter period of treatment (3-5 days).

Until now, the prevention of the diseases, throw prophylactic methods doesn't registered, significant success, because of a multitude of factors (unknown sources of infection, natural short postinfection immunity and the impossibility to realise an efficient and long period protection in general population and for all the types of meningococcus).

The prophilaxis can be induce at two levels: of throw immunisation for the first cases and throw medical surveillance, chemoprophilaxis or immunization for the secondary cases. Rifampicine (1200 mg/day for adults and 10-20 mg/kgc/day for children, for a period of 5 days), spyramicin (2 g/day for adults, 50 mg/kgc/day for children, for a period of 5 days), minocycline (10 mg/day, for 4 days) and recently ciprofloxacine (500 mg, as unique dose). Penicillin G is not efficient for chemoprophylaxis. As vaccines, there are polysaccaridic types, used against the serogroup A, C, Y and W135. For the type B (its polysaccaride is not antigenic) the scientists have discovered a proteic vaccine or complex of it. There are monovalent, bivalent (A+C) or thetravalent (A+C+Y+W135) vaccines. The dose is unique and consists of 50 microgram (0,5 ml) for any age. The deltoid is recomanded for innoculation.

Because of the mild evolution of the meningitis with N.m. type A, in our country, our chemoprophilactic experience and the immunisation are not so great. The last few years (type B predominance) the epidemiological changes produce different aspects of clinical manifestations and rate death, which will recomand an other attitude for chemoprophilaxis and immunisations.