POSSIBILITIES AND PERSPECTIVES IN CONTROL AND PREVENTION OF HEPATITIS B AND C (REPORT)

Monica *Sabău*

Department of Epidemiology,
University of Medicine and Pharmacy, Târgu Mureş

The viral hepatitis, especially hepatitis B and C are major cause of worldwide morbidity and mortality, as well as the cauze of a long-term sequelae of chronic infection. It is generaly accepted that 90% of the chronic liver disease has a viral etiology, being involved predominantly hepatitis viruses with parenteral transmission. In such circumstances a complex plan for control and prevention of these diseases is necessary.

The efficacy of general prophylactic measures towards the reservoires of infectionand routes of transmission is limited because of the complexity of epidemiological process of hepatitis B and hepatitis C virus infections. So, active immunization represents an important mean for controling these diseases.

Plasma-derivated B vaccine and recombinant hepatitis B vaccine are available, both generation of vaccines having similar efficacy and tolerability profiles and being accepted by WHO.

There is a wide global variation in patterns of HBV prevalence and the immunization strategies should be implemented in accordance with these geographical differences. Universal vaccination of neonates is recommended for areas with high and intermediate endemicity where infection accurs primarily at birth and early childhood. In low endemicity areas the high-risk groups have been selected for active immunization. However, in some countries an adequated level of antibody may not be achievable in high-risk individuals. An expanded vaccination program, including neonatal vaccination may be more effective for these areas, because the increasing cost of illness, lower vaccine acquisition cost and because the immune protection appeared before the persons are engaged in high-risk behaviour.But the implementation of universal vaccination program in areas of low endemicity requires further evaluation, in the last time being noticed a decline in the rate of HBV infection as a result of lifestyle changes.

In 1994, more than 72 countries comprising 35% of the world's newborns and 55-60% of HBV carriers, already had a national policy of routine infant immunization with HB vaccine. If the 1995 and 1997 targets of the Global Advisory Group of Expanded Program on Immunization are met, the prevalence of HBV carrier of the world will be reduced to less than 1% saving millions of deaths from cirrhosis and primary liver cancer.

Immunization with a sure and potent hepatitis B vaccine has been selected by the Ministery of Health - Romania as the mean to control HBV infection. It has been selected 2 medical strategies, universal infant immunization and additional strategy-immunization of health care workers at high risk.

Hepatitis B vaccination produces a protective antibody response in more than 95% of healthy individuals less than 40 years, but in immunocompromised patients the failure of the response to HB vaccination is common. Evidence for the existence of an immune gene that would regulate response to HB vaccine in humans has been reported. A marked increase in the frequency of two haplotypes of HLA(B_8, SCO_1, DR_3 and B_{44}, DR_7, FC_{31}) was found in nonresponders to HB vaccine. Recent studies regarding the identification of critical T-cell epitopes ($HLA\text{-}A_2$) in the HBV core protein has lead to the formulation of a potentially therapeutic peptide vaccine to treat chronic hepatitis B.

The description of children born to HBsAg and acquiring anti-HBs protective levels, provided the evidence of the existance of "surface mutants" of HBV. The emergence of viruses that escape neutralization by vaccine-induced antibody poses a threat to the goal of controlling hepatitis B by a large-scale universal vaccination program, especially in areas with high prevalence of infection. It has been suggested that pre-S_1 and pre-S_2 surface containing recombinant vaccines will overcome the problem of infection with escape mutants of HBV. The incorporation of the pre-S_2 antigen into HB vaccine has also bypassed nonresponsiveness and has induced significantly higher anti-HBs titers.

In spite of the progress in molecular biology of HCV many characteristics of the virus remain obscure. The development of an in vitro propagation system for HCV is imperative necessary for the investigations concerning the mechanism of viral replication, the morphology of the native particle, the function of various proteins and for development of a vaccine. Although the initial immunization experiments with recombinant HCV proteins in chimpanzees revealed the difficulty of eliciting a sufficient high antibody titer, the results of recent investigations using putative envelope glycoproteins E_1(gp33) and E_2(gp72) provide considerable encouragement for the control of HCV with host´s immune system, to obtain more information about the biology of HCV.

Until the development of an effective HCV vaccine, the effort is directed towards the prevention of parenteral transmission of HCV by blood and plasma derivatives. Retrospective analysis of occurrence of transfusion-associated hepatitis showed that 60-80% of hepatitis C cases have been prevented by anti-HCV screening by first-generation assays. The prevention

rate could increases to over 90% with the routine use of second and third-generation assays.

The hepatitis B and C vaccination alone cannot solve all the epidemiological problems of these diseases, the active immunization has to be associated by general prophylactic measures. An important factor will be also education of the public about the serious consequences of HBV and HCV infections to encourage financial support for preventive programmes.