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PECULIARITIES OF THE EPIDEMIC PROCESS OF EPIDEMIC PAROTITIS UNDER THE CONDITIONS OF MASS IMMUNOPROPHYLAXIS

R. Konstantinov, M. Gospodinova, D. Radkova, K. Kirova, D. Nikolova, Ts. Paunov

Department of Infectious Diseases and Epidemiology, Medical University of Varna, Varna

Some specific features of the mumps epidemic process under the conditions of mass immunoprevention were analyzed. Incidence rates were higher when there was a remoteness of the primary immunization by live parotitis vaccine. Certain opportunities for amending the epidemic control with this vaccine to avoid infection were emphasized.

Key-words: Epidemic parotitis, mass immunoprevention, live vaccine, incidence rate, Varna region

The application of the live virus vaccines for prevention of upper respiratory tract infections began in the 70s and gave rise to favourable changes during the mumps and morbilli epidemic process (1,6). The incidence rate sharply decreased when compared with the that in the preimmunization period, the seasonal character of the diseases was outlined if even at a considerably lower level, and the interval between the epidemic years was prolonged. Along with these favourable trends, some disadvantageous ones arised, the reasons of which being of a complex nature.

Address for correspondence:
R. Konstantinov, Dept. of Infectious Diseases and Epidemiology, Medical University, 55 Marin Drinov St, BG-9002 Varna, BULGARIA
E-mail: infect@asclep.muvar.acad.bg

We aimed at determining some important epidemiologic features of the mumps epidemic process in the last two epidemic years with a view of a mass immunoprevention by a live anti-parotitis vaccine and at indicating some programme tasks, the success of the mass immunoprevention depending on their solution.

MATERIAL AND METHODS

The results of an epidemiologic study of the incidence rate of mumps in 1997-1998 in the region of Varna were used. Data from the reported cases of mumps in the listings of the Hygienic and Epidemiologic Inspection of Varna were analyzed. These sources were processed by means of statistical analyses and epidemiological methods.

RESULTS AND DISCUSSION

During the two years covered a total of 3694 mumps cases were registered. In 1997, there were 1724 cases (381,77 per 100 000 inhabitants) but in 1998 there were 1970 ones (436,24 per 100 000 inhabitants). The analysis of the epidemic situation and of the incidence rate of the parotitis in Bulgaria focused on the beginning of a new epidemic wave with extremely high prevalence of the disease in North-Eastern Bulgaria (4). The process arose after 9 years of fading because of a mass immunization by anti-parotitis vaccine.

The distribution of the mumps incidence rates according to the age groups was demonstrated on Fig. 1. It was evident that during these two epidemic year the age group between 9 and 14 years showed the highest values: 2337,9 cases per 100 000 inhabitants in 1997 and 2389 cases per 100 000 inhabitants in 1998. The situation concerning the morbidity rates in these two years was similar (Fig. 2). The ill children aged between 1 and 7 years demonstrated a great difference in their distribution when the post- and pre-immunization periods were covered (1,5-7). This "over-ageing" of the incidence rate

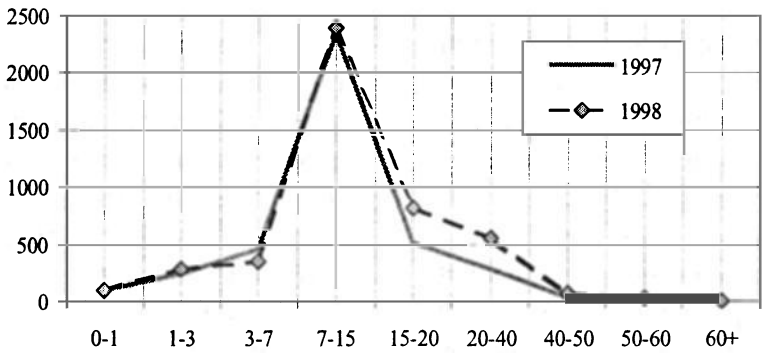

Fig. 1. Age structure of the epidemic parotitis incidence rate in Varna region in 1997and 1998

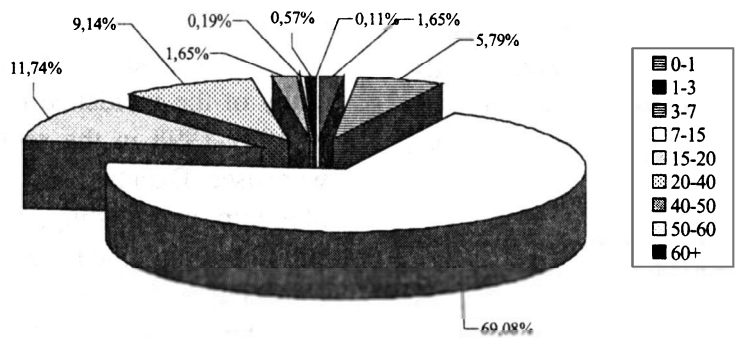

Fig. 2. Age distribution of the epidemic parotitis patients in Varna region in 1997 and 1998

could be explained by the changes of the parotitis epidemiological patterns during the years of the mass immunoprevention by a live anti-parotitis vaccine. The investigations of the immune status of the Bulgarian population revealed a great delay of covering with the anti-parotitis vaccine, especially of the school children aged between 10 and 14 years (4). It was caused by the cancelled immunization measures during the period from 1982 till 1984. Campaign corrective immunizations failed, obviously, to cover completely and timely the children subjected to immunization during the period without any immunization against mumps.

The analysis of the years of the pre-epidemic period (3) explained the reasons for the present epidemic situation. It was established that in this period the 1-10-year old children got the mumps more often (71 %) as compared with the school children aged between 10 and 14 years (13,7 %). During the sero-epidemic investigations a low level of protection against the disease in the age of 20-30 years was found. The school children and military staff were more often affected than other contingents. These results showed that in the years of a continuous pre-epidemic period acceptable contingents were formed between the older groups due to the collective actions of some organizations and to social reasons as well. There was a situation when under conditions of teams of subjects formed by these age groups the epidemic process originated. This fact was epidemiologically determined (1,5,7).

The male sex and the urban population were predominantly affected (Fig. 3). Most cases were registered during the winter-spring period (Fig. 4) that was in accordance with the epidemic features of mumps. The immune status of the patients with parotitis indicated that the individuals with unknown immune status dominated (69 %) over those with previous immunization in childhood (31 % of the cases). The data about the country as a whole were similar.

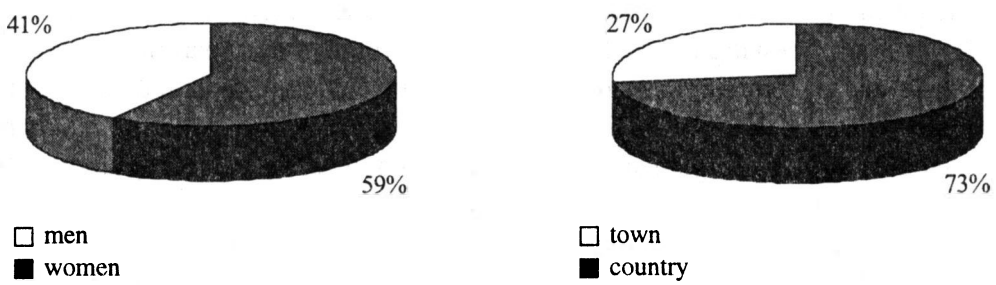

Fig. 3. Epidemic parotitis patients' distribution in Varna region in 1997 and 1998 according to sex and residence

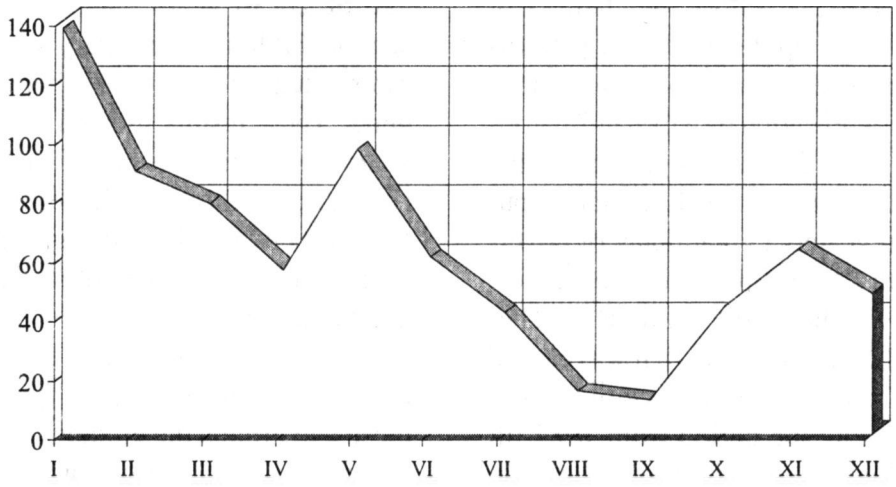

Fig. 4. Seasonal dynamics of the epidemic parotitis incidence rate in Varna region in 1997 and 1998

The incidence rate among the immunized contingents can be related with the qualities of the biological products used. In the beginning, a Bulgarian NCZPB vaccine was applied but later on a Russian live anti-parotitis vaccine was administered (1,8) which replaced the morbilli-parotitis-rubeola tri-vaccine.

There are antagonistic points of view in the Russian literature available (9) about the qualities of the mumps vaccine we have made use of. It is sure there are problems because they recognize the need of renewing the biological product and of reducing it to meet the requirements of the WHO. These facts together with the organizational aspects give proof of the epidemic process development in the aged groups.

Some 287 patients out of a total of 3,694 ones during the two epidemic years were hospitalized in the Clinic of Infectious Diseases, Medical University of Varna, as cases with severe clinical course of parotitis. The percentage of the patients with complicated course of the disease in Bulgaria was smaller (3,2 %) (4). This is explained by the higher parotitis incidence rate in the region of Varna. Some 112 patients (39,02 % of all the hospitalized cases) presented with another localization of the pathological process such as meningitis, orchitis, pancreatitis and lesion of the acoustic nerve.

The epidemiological analysis of the morbidity rate of parotitis during the last two epidemic years indicates that a large prophylaxis programme should be realized to get the correct epidemic status. The following measures have to be accomplished:

1.To investigate the immune status of the risk age groups as a result of immunizations by various vaccines.

2. To identify the quality and effectiveness of the live anti-parotitis vaccine currently used and to show the opportunity for eradication of the mumps virus.

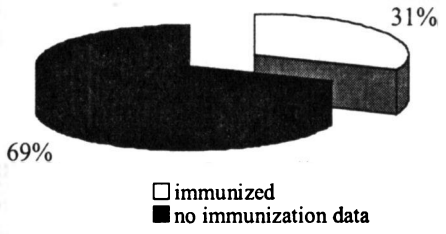

Fig. 5. Relative share of persons immunized by anti-mumps vaccine among the parotitis patients in Varna region in 1997 and 1998

3. To examine the correlation between the immunization and naturally existing epidemic process.

4. To up-date the immunization calender (8) by introducing a re-immunization schedule by morbilli-parotitis-rubeola tri-vaccine, eventually at the age of 7 and 11-12 years thus observing the recommendations of the experts of the Centers for Disease Control and Prevention (Atlanta, GA, USA) as applicable in Bulgaria (10).

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Особености на епидемичния процес при епидемичния паротит в условията на масова имунопрофилактика

Р. Константинов, М. Господинова, Д. Радкова, К. Кирова, Д. Николова, Ц. Паунов

Катедра по инфекциозни болести и епидемиология, Медицински университет-Варна

Резюме: Анализират се особеностите на епидемиологичния процес при епидемичния паротит в условията на масова имунопрофилактика. Установява се увеличаване честотата на заболяванията с отдалечаване от първичната имунизация с жива противопаротитна ваксина. Разглеждат се някои възможности за подобряване на епидемиологичния контрол при тази ваксино-предотвратима инфекция.