Assessment of Oxolin Preventive Effectiveness

During an Influenza Epidemic

E.A. Shablovskaya, A.B. Urin, V.V.Kurgenove, L.V. Shevchenko,

N.A. Kholyavko, N.D. Klimchuk, T.B. Blokh, V.A.Migalin

Lvov Scientific Research Institute of Epidemiology and Microbiology

Oxolin as a means of prevention was tested during an influenza epidemic in 1970 caused by the type A2(Hong Kong)68 influenza virus in an encrypted experiment on 611 students of Lvov Medical School, aged 15-18 years. The preparation was administered as 0.25% ointment to 3,245 people twice a day and to 121 people once a day during the entire epidemic period. Vaseline (ointment base) was used as placebo on 126 people. A total of 119 students were kept in the control group and they were not administered medication. The use of ointment encrypted as preparation No. 1 and placebo (preparation No. 2) were given under the control of the Institute staff.

The experiment was conducted to study the incidence of influenza and acute respiratory diseases, immunological shifts and the isolation of the influenza virus in the persons under observation. Similar phenomena were also taken into account.

Influenza virus isolation was carried out according to the generally accepted virological method by infecting 10-12-day-old chicken embryos with nasopharyngeal content taken from 120 persons using oxolin, from 31 students in the placebo group and from 31 persons in the control group. A study of the samples of paired blood sera obtained during the same period from 85 individuals who used oxolin twice daily, from 21 individuals who used oxolin once daily, from 88 placebo individuals and from 45 individuals in the control group, was conducted based on the hemagglutination inhibition reaction with standard influenza diagnostic agents of A-Shkliver/48, AI-650/472/53, A2-151/65, A2-Hong Kong, B-Moscow-95/59, V-Dushanbe/66 produced by the Leningrad IVS, as well as with antigen from the local strains of A2-Hong Kong influenza virus isolated during the outbreak.

The data on the incidence of influenza and acute respiratory diseases, obtained based on the medical records, were subjected to a statistical analysis.

The oxolin prophylactic treatment at the height of the outbreak produced a reduction in influenza and acute respiratory disease incidence among those who used oxolin ointment. Oxolin provided protective action not only when it was applied twice daily, but also when administered once a day. The incidence of influenza and acute respiratory infections was (per 100 people): in the group of persons who used oxolin twice a day was 16.8, who used oxolin ointment once a day - 18.1, who used placebo - 21.4, among those were not administered anything (control group) - 82.8.

Oxolin efficacy index was 2.01 among the persons who used the preparation twice a day and 1.8 – among the persons who used oxolin once a day.

It should be noted that the use of vaseline also produced some protective effect (efficacy index 1.5), possibly due to the mechanical protection of the respiratory tract mucous membrane, although the chemical effect of vaseline should not be ruled out.

The prophylactic effect of oxolin on the influenza virus was also confirmed by the results of virological and serological studies. Thus, at the beginning of the epidemic, before the preparation was administered, type A2-(Hong Kong)68 influenza virus was isolated in 5,4% of the persons under observation. During the period of administration of the preparation, hemagglutinating viruses with low titres were detected in 8.2% of those who used oxolin and 24.4% of those in the control group.

The results of serological studies confirmed the protective effect of oxolin. In the group of persons who used oxolin twice a day, an increase by a factor of four or more of the titers of the anti-influenza antibodies to the type A2-Gong Kong influenza virus were found in 28.7%, and among the seronegative persons seroconversion was observed in 28.6% of those who were examined, while in the control group these figures were 33.3 and 57.1% respectively.

While seroconversion rates among the seronegative persons from the group that applied oxolin once a day (25.0%) were close to those of the group that applied oxolin twice a day (28.6%), among the seronegative persons from the group that applied placebo, seroconversion was observed in 56.2%, i.e. almost as among those in the control group (51.1%).

The results of immunological shifts of the anti-influenza antibodies to the influenza type B virus, that emerged at the end of the outbreak, were similar. An increase in the number of the influenza B antibodies titres by a factor of four or more was observed in 16.4% of the individuals who had used oxolin twice daily, 14.3% among those who had used oxolin once daily, and 37.8% among those in the control group, with seroconversion among the seronegative individuals reported in 27.9, 21.4 and 46.1% respectively.

It should be noted that prolonged use of oxolin (up to 30 days according to the observation data) was accompanied by some side effects: nose bleeding, runny nose, headaches in 26.7% of the persons who used oxolin twice a day.

To summerize the results to the experiment to study the prevention of influenza with oxolin ointment, we can conclude that oxolin has a protective anti-influenza effect. However, a somewhat inconvenient method of application (daily during the entire epidemic period), as well as the side effects observed reduce the value of the medication. Oxolin can be used as one drug in a battery of influenza control agents.