

## **The use of arbidol in the prevention of acute viral respiratory infections and complications in servicemen**

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Among military servicemen, acute viral respiratory infection (AVRI) epidemics can cause as many as 20-25% to fall ill. The problem of AVRI is especially severe for servicemen, with their high risk of respiratory system infection. It is a particular risk in newly reformed divisions, in training centers, in divisions comprised of groups working together in areas of military conflict, and within peacekeeping forces. The most serious complication of AVRI is “extra-hospital pneumonia” – “EP.”

The diseases referred to as EP belong to a group of acute respiratory illnesses with varied etiologies, pathogenesis, and morphological qualities. They are characterized by central respiratory distress to the lungs; intra-alveolar exudate is apparent upon physical examination and radiologic studies [3]. EP accompanies overexposure to cold, acclimatization, the stress of adaptation to army life and conditions, close living quarters, a decrease in body mass, and other factors.

The epidemiological significance of influenza and other types of AVRI as risk factors for EP comes from the fact that these illnesses weaken the immune system in military service populations, and enable entry of *pneumococcus* and other infectious pathogens in the body. In addition, they enable the mechanism for transmission of *Streptococcus pneumoniae*, which appears in 64-72% of EP patients. Among training center inhabitants who have contracted EP, AVRI presence as a risk factor has been shown at more than 30% [2].

In recent years, the urgency of finding a reasonable and effective means to prevent AVRI and its complications among military forces has increased. Developments in immunology have allowed us to reexamine our earlier theories regarding primary prevention of respiratory infections, and search for drugs containing antiviral and immunotropic properties. Among the latest, most promising agents are endogenous interferon inducers, whose increased concentration levels in blood and secretions prevent the development of viral infections. One of these antiviral preparations is the Russian preparation “arbidol” (Masterlek Co.).

In 2002 and 2003, specialists at the national medical-epidemiological center, under supervision of the Russian Federation Department of Defense, studied the epidemiological effectiveness of arbidol in groups of servicemen with AVRI. The results

show heightened activity of the drug during the initial infection period of these illnesses [4]. On the basis of information received during previous experiments, we have used arbidol as prophylaxis not only for AVRI, but also EP, which often arises as a result of viral infections.

The experimental groups were taken from training centers, and were studied from June 10-30, 2003, and December 15, 2003 to January 5, 2004. The groups were mostly made up of conscripted servicemen, in towns from the Rostov, Kaluzhsky, Lipets, Voronezh, Vladimir, Tver and Kursk oblasts (regions).

In open comparison studies, 4175 servicemen participated, ranging in age from 18 to 22 years old. Together with standard measures for pneumonia prophylaxis, the experimental group (n = 2005) took arbidol 0.2 grams twice a week for three weeks; the total prophylactic course was 1.2 grams. The comparison (control) group was 2170 servicemen. The groups were observed for a period of three months following the first administration of the drug. Viral pneumonia etiology was determined by the results of lab tests: bacteriologic (sputum) and serologic (blood serum tests: immunoenzyme assay, hemagglutination inhibition test, and polymerase chain reaction).

**Influence of arbidol on the susceptibility of servicemen to Influenza, other AVRI, and extra-hospital pneumonia (%)**

Diagnosis	Experimental group	Control group	Standard deviation (percentage amount error)	Probable interval (95% probability) of lowering rate of infection by use of arbidol prophylaxis (from...to...)
Influenza, other AVRI	14.1	30.8	1.30	14.2 ÷ 19.2
Pneumonia	2.6	3.8	0.55	0.1 ÷ 2.3
Out of the above, bacterial pneumonia (primarily <i>streptococcus pneumoniae</i> )	1.2	1.4	0.55	Determination not reliable
Out of the above, viro-bacterial pneumonia (following AVRI)	1.4	2.4	0.42	0.2 ÷ 1.8

We used the statistical method of determination of average amount (event probability, %), probability intervals for variation of events (% -- from ... to ...), and standard deviation [1] (see table).

The data we collected again shows the high effectiveness of arbidol in the prophylaxis of influenza and other ARVI.

Independent of the manifestation of epidemic rise in illness among servicemen who did not take arbidol, in the experimental group there remained a minimum threshold of infection with influenza and other ARVI's – 10-15%. At the same time, the infection rate

of servicemen with EP was lowered due to smaller numbers of those who had become infected with viro-bacterial pneumonia. The number of patients with strictly bacterial (most often, caused by *pneumococcus*) pneumonia did not change.

Thus, use of the domestic drug arbidol along with environmental and hygienic measures allows the possibility of effectively lowering the rate of infection of influenza and other ARVI's in the military setting, and also lowering the rate of viro-bacterial pneumonia.

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