Original Article

Microbiological Research in New Medicines in the Form of an Effervescent Tablet with Polyhexamethyleneguanidine

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Abstract

This work describes microbiological researches on new drugs of public transport before and after treatment with effervescent tablets developed by us with the active substance polyhexamethyleneguanidine.

Keywords: effervescent tablet, Polyhexamethyleneguanidine, Microbiological testing, Disinfection

Introduction

Modern medicine of the 21st century defeated most of the known diseases of humanity at present. The advanced scientists in many countries of the world are working on the creation of drugs to increase the life expectancy of a person. But the further they go to achieve their goals, they are faced with newer infections, which are virulent to the drugs, used to combat them. Today, most spread and insidious are infectious diseases. The spread of infections depends on the social human environment. Every year, infectious diseases take hundreds of thousands of lives, and many who have been ill get incurable complications for the rest of their lives. Leading countries for the spread of these diseases remain South Africa and India (the sickness rate of the population is 98.5%).

There are many places of infection with infectious diseases, but the most basic places are crowded places. The most spread foci of infection are places of public transport. Scientists believe that people who move by private transport, get sick less than every other, who are forced to use public transport. Being that in public transport is a very high likelihood of catching by airborne and by contact.

In the autumn-winter period and the period of epidemics, moving by land or by underground transport, susceptible to acute respiratory viral infections, infections, influenza, papillomavirus, herpes simplex virus, Epstein-Barr virus (infectious mononucleosis), virus chickenpox, measles virus, as well as one of the dangerous diseases - tuberculosis. Therefore, to prevent contamination of the population in transport, the state assumes responsibility for the disinfection of public transport.

Polyhexamethyleneguanidine a broad-spectrum polymer biocidal medicine that is used as an active ingredient in many modern disinfectants (over 60). It is the most promising non-oxidizing substance for various types of disinfection. According to published data, in terms of its biocidal action, this drug is 2 times more effective than chloramine, 5 times more effective than phenol. Aqueous polymer solutions with a concentration of 0,05 – 0,10 % for 5 – 10 minutes cause the death of Corynebacterium diphtheria, Staphylococcus aureus, Shigella Sontaga and Flexner, Salmonella Gartner and Breslau, botulinum bacteria, vulgar protea, typhoid, wonderful, intestinal and Pseudomonas aeruginosa. The study in this work describes microbiological researches on new drugs of public transport before and after treatment with effervescent tablets developed by us with the active substance polyhexamethyleneguanidine.

Materials and Methods

The microbiological control was carried out using the Lumitester System Super Snap luminometer. One of the most

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How to cite this article: Victoria, A., Natalia, H., Mustafa, A., Alexey, K., Lena, D., Koval, A. Microbiological Research in New Medicines in the Form of an Effervescent Tablet with Polyhexamethyleneguanidine. Arch Pharma Pract 2020;11(4):152-4.

common of transport, such as buses and taxis, have been chosen, their microbiological contamination was investigated at the beginning of the experiment. Then, they were processed with test effervescent tablets and released into work. Microbiological measurements were done three and six weeks later.

To combat foci of pathogens infections used UV-LAMP But this method is not effective, because the lamp disinfects only the visible surfaces, as gap and cracks remain the site of infection [1, 2]. Then, to increase the effectiveness of using a variety of chemicals. In most cases, these are dry substances or ready-to-use remedies. These substances are not always easy to use or transport (they are difficult to transport, there is a need somewhere to weigh out and a long time to dissolve the dry substance).

To improve the efficiency of the movable transport composition processing and ease of use. We developed and investigated a new preparation for disinfection in the effervescent tablets form [3]. This is a very convenient modern drug, which is easily transported, dispersed, and dissolved [4-7]. The active substance of the developed tablets is polyhexamethylene guanidine which has many properties: disinfectant, bactericidal, antimicrobial, can be used as a preservative [8]. It has low toxic, chemically non-aggressive, and ecological friendly [9-11]. Polyhexamethyleneguanidine is used for disinfection in medicine, veterinary medicine, and industry, are used for processing land, rail transport, and metro, as well as for disinfection of communal facilities, educational institutions, for cleaning and disinfection of water in swimming pools and aqua park [12, 13].

After selecting the mass of the active substance and the composition of the effervescent tablet, we carried out a microbiological examination of the resulting formulation. In our test, were used a bus and a taxi.

Results and Discussion

The first stage of our work was the measurement of microbiological contamination of the interior surfaces of the bus and taxi, which was used by Lumitester System Super Snap [14, 15]. After receiving the results of microbiological contamination, the salons of the bus and taxi were processed by the test drug and released for the work. After three and six weeks of the processing, swabs were taken with the following results, in Table 1 [16].

Table 1. Microbiological study of public transport

Type of transport	Places of study	Control measurement	3 weeks	6 weeks
		measurement RLU		
Bus	Air conditioning	7436	19	29
	Back of passenger seat	3134	12	31
	Handrail	9648	18	34
	Handle for handrails	more 10000	26	78
Taxi	Passenger seat	533	9	42
	Handle of the door	848	24	49

As can be seen from the data in Table 1, the developed preparation for disinfection based on polyhexamethylene guanidine has a pronounced antimicrobial effect, after 3 and 6 weeks he continues to act on the microbial cell, not allowing it to develop and grow. And use this drug in the form of effervescent tablets simplifies its dissolution and use.

Conclusions

1. Polyhexamethylene guanidine does not have a toxic effect.
2. Polyhexamethylene guanidine can be used to disinfect public places, medical and educational organizations, and kindergartens.

Conflict of Interest

The authors declare that they have no conflict of interest to disclose. All institutional and national guidelines for the care and use of laboratory animals were followed.

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