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THREAT OF DIPHTHERIA OUTBREAK IN UKRAINE IN THE PERIOD OF WAR TIME

The relevance of the topic is determined by the priority and importance of preserving the health of Ukrainian population by improving the current rate of vaccinated individuals against diphtheria. Diphtheria is assigned to one of the dangerous and life-threatening diseases in humans. Immunization is the only means of creating a favorable epidemic situation [1]. Ensuring of non-susceptibility of people to this infection prevents the incidence and spread of diphtheria in the population.

The aim of the paper is to analyze the current views on diagnosis and management of diphtheria in children. They have been analyzed, using the bibliosemantic method of study.

The WHO reports that epidemic situation in diphtheria morbidity has worsened in the world, particularly in Latin America, where a rise in incidence has not been recorded since 1990. Diphtheria remains a health threat in India, Venezuela, Yemen, Bangladesh (Cox's Bazar), where the intensive growth of the incidence of this infection began in 2017; 80% of all reported cases of diphtheria in Latin America were registered in Venezuela. Despite vaccination of Venezuela population, in 2018, 1.2 thousand cases of diphtheria were reported, of which more than 80 cases were lethal. In Haiti, about 250 cases were reported, of which 3 cases were lethal; in Colombia, about 10 cases were reported during the same period, which can be related to forced migration of the population from the countries where diphtheria infection cases are recorded. The comparison with the post-Soviet countries, for example, in the Republic of Kazakhstan, showed that long-term dynamics for 1990-2012 is characterized by the outbreaks of diphtheria in the period from 1993 to 1998, when local outbreaks with a peak of incidence in 1995 were recorded (1105 cases, including 31 lethal cases). According to the WHO reports of 2019, Ukraine is threatened with a diphtheria outbreak due to insufficient stock of anatoxin and low rate of vaccinated population in recent years [8]. In the last 9 years, sporadic cases of diphtheria have been reported in Ukraine annually (with the exception of 2017). In 2010-2018, a total of 56 diphtheria patients, including 12 children and 44 adults were registered. No lethal cases have been reported. The first 2 cases of diphtheria were registered in 2018 in the territory of Lugansk region, controlled by Ukraine. In November, 2019, 23 cases of diphtheria were registered, including 5 cases confirmed by laboratory tests: per 1 case among residents of Lugansk, Khmelnytsky, Ternopil, Zakarpatska regions and Kyiv city. 14 presumptive cases of diphtheria were reported among contact persons in Zakarpatska region and one case in Kyiv. The number of reported cases for the period of 2012-2019 increased 4.6 times: from 5 in 2012 to 23 – in 2019. In 2019, one case was registered in February (Lugansk region) and in August (Khmelnytsky region). The remaining 18 cases were reported in October. In 2019, among the diphtheria patients 19 cases were reported in adults. By localization of the lesion, in the Luhansk region diphtheria of the eye was reported, and in other cases diphtheria of the throat/ tonsils was registered. According to the results of bacteriological

examination, *Corynebacterium ulcerans* was reported in one patient from Kiev, in 18 other cases it was *Corynebacterium diphtheriae*. According to the Public Health Center, as of the end of 2019, 1542650 adults were vaccinated against diphtheria, accounting for 52.3% of the planned volume. The last epidemic of diphtheria in Ukraine was reported in 1991-1998. During its time, 495 adults died (MOH data for 1999), but according to the Internet resource, the total number was about 700 people, which is probably a picture in the following 2000- and years and infant mortality. According to the Ministry of Health of Ukraine, in 2003 the incidence among adults in Ukraine decreased by 53 % and constituted the intensive indicator of 0.33, while the infant diphtheria incidence was 0.44 and exceeded the similar values among the adult population by 25 %. At the end of 2003, the overall mortality rate for diphtheria in Ukraine among adults was 0.8 % and 5.7 % among children. Patients died from severe complications of myocarditis, polyneuropathy, infectious-toxic shock, and all of them were hospitalized late and had their last vaccination more than 10 years ago [2].

Vaccination coverage 2020-2022 in the Poltava Region and Ukraine

The name of the vaccination	2020 year		2021 year		9 months 2022 year	
	Region %	Ukraine %	Region %	Ukraine %	Region %	Ukraine %
Vaccination against whooping cough, diphtheria, tetanus of children under 1 year	89,8	80,1	90,6	80,1	72,5	46,9
Revaccination against whooping cough, diphtheria, tetanus of children in 18months	92,1	78,1	91,6	78,1	72,7	46,1
Revaccination against diphtheria, tetanus of children in 6 year	58,7	59,7	83,8	59,7	69,3	46,6
Revaccination against diphtheria, tetanus of children in 16 year	90,4	73,6	92,2	73,6	65,8	43,4
Revaccination against diphtheria, tetanus in adults	76,6	47,0	75,0	47,0	52,3	24,2

We have come across reports of a fiery outbreak of diphtheria in September 2022 in one of the western regions of Ukraine. Therefore, taking into account the overcrowding of the population under the conditions that prevailed during the martial law, it is necessary to keep the vaccination situation under control.

Conclusions

Thus, pediatricians, family doctors, infectiologists should carry out prophylaxis among the population regarding the need for timely vaccination against diphtheria, as it is a reliable measure of preventing morbidity and reduction the risk of complications and toxic forms, leading to lethal outcomes, especially among children [3].

References:

1. Dureab F., Al-Sakkaf M., Ismail O. et al. Diphtheria outbreak in Yemen: the impact of conflict on a fragile health system. *Confl. Health*. 2019;13:19. doi: 10.1186/s13031-019-0204-2.
2. Kateryna V. Pikul, Ludmyla M. Syzova, Valentina I. Ilchenko, Irina M. Zvyagolska. Diphtheria: current public health challenge in Ukraine and worldwide (literature review)/*Wiadomosci Lekarskie*. – 2021. – V. LXXIV, ISS.1– P. 137–143.
3. Picul E.V., Il'chenko V.I., Il'chenko M.N. et al. Problemy aktyvnoyi imunizatsiyi u ditey Poltavskoyi oblasti [Problems of the active children immunization in Poltava region]. /*World of medicine and biology*. 2010;4:48–53. (In Ukrainian).