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Problems of providing medical care to children of Ukraine as a result of russian aggression

Abstract. Background. The russian aggression in Ukraine has caused numerous casualties among civilians, including children. Military actions lead directly or indirectly to increased morbidity in adults and children and to chronic stress, especially in children. The purpose of this research was to analyze the problems of providing medical assistance to the children of Ukraine who are suffering from the russian invasion. **Materials and methods.** We have used the official statistical and own data for 2022–2023. **Results.** Currently, more than 7.5 million Ukrainian children are suffering from the war, not only due to physical injuries but also violations of their mental and psycho-emotional state. A special problem for Ukrainian paediatricians at the beginning of 2023 was an increase in the incidence of acute respiratory diseases, COVID-19 and stress disorders in children due to a shortage of medical personnel and infrastructure. Also, in conditions of limited access to medical care and medicines, it is necessary to pay attention to chronic diseases, in particular, asthma and other allergic diseases. Paediatricians from the departments of the Bogomolets National Medical University provided voluntary assistance to children in frontline regions. **Conclusions.** In the new conditions of warfare, where civilians and life support infrastructure have become the target of armed attacks, children have become the most vulnerable group. The issues of restoration of full medical care for children, including emergency and urgent care, provision with doctors of certain paediatric specialties, full supply of medicines and medical devices, and restoration of destroyed medical infrastructure remain extremely relevant to the health system in the frontline and liberated areas.

Keywords: Ukraine; children; russian aggression; medical care

Introduction

A full-scale russian invasion of the territory of the sovereign European state of Ukraine has been underway for more than a year. Russian aggression in Ukraine has resulted in numerous civilian casualties, including children. Military actions lead directly or indirectly to increased morbidity and chronic stress in adults and children, especially children. Currently, more than 7.5 million Ukrainian children are suffering from the war, not only due to physical injuries but also violations of their mental and psycho-emotional state. The following is an update and description of the problems of providing medical care to children in Ukraine suffering from the multifactorial effects of war.

The purpose. The main purpose of this research was to analyze the problems of providing medical assistance to children in Ukraine who are suffering from the past wars.

Materials and methods

We have used official statistical and own data for 2022–2023. These data were analysed using systemic approach and statistical epidemiological analysis.

Results

According to the Prosecutor General of Ukraine (<https://www.gp.gov.ua>), since the beginning of the full-scale invasion by russia, 467 children are reported missing,

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464 children have already been killed and 944 wounded as a result of shelling of civilian Ukrainian towns and villages. These figures are far from definitive, as they are still being compiled in areas of active hostilities, temporarily occupied and liberated areas.

In addition, official sources report the forced deportation of Ukrainian children to Russia or Belarus, which has already affected more than 13,899 children. This action is linked to the forced change of citizenship [1].

The main challenges facing Ukrainian paediatrics today are not only the war, but also the ongoing COVID-19 pandemic, the threat of outbreaks of new and known infectious diseases, an increase in the incidence and prevalence of other childhood illnesses, particularly behavioural and mental disorders, and the consequent growing need of the child population for affordable and quality health care [2, 3].

More than 9 million Ukrainians are already refugees in their own country. According to the United Nations High Commissioner for Refugees, 4.7 million Ukrainians have gone abroad, including at least 2 million children [4, 5]. One and a half million Ukrainian citizens and children have taken refuge in Poland [6]. The Ukrainian people will always be grateful for help.

The physical and mental health of more than 3 million children who have become internally displaced, losing their homes and schools, often separated from their parents, friends and pets, is another painful issue for us today. In winter, Russia does not stop its rocket and bomb attacks on Ukraine's critical infrastructure, trying to deprive Ukrainians of light, heat and water during the cold season. This is especially true for hospitals, which need energy stability and autonomy to ensure uninterrupted medical care.

During the year of aggression, Russia carried out at least 707 attacks on Ukrainian medical infrastructure, with an average of two attacks a day on the health system since February 24, 2022, including the bombing of hospitals, the torture of doctors and the shelling of emergency medical vehicles. Relevant data is provided in the study "Hospitals under the crosshairs: how Russia destroyed the health care system of Ukraine during the year", published on 22 February by EyeWitness to Atrocities, Insecurity Insight, Media Initiative for Human Rights and the Ukrainian Healthcare Centre [7].

According to the documents, more than a third of all recorded attacks on the health care system in the world in 2022 were committed in Ukraine during the Russian invasion. At the same time, the report emphasizes that the attacks by the Russian Federation on the Ukrainian health care system during this period are notable for their scale and brutality.

As a result of the aggressor's 292 attacks in Ukraine, 218 hospitals and outpatient facilities were completely damaged or destroyed (Fig. 1). In this way, every tenth Ukrainian health care facility was damaged. The medical infrastructure of the Luhansk, Donetsk, Kharkiv, Chernihiv and Kyiv regions suffered the most from the aggressor's actions [7, 8].

Eighty-six attacks on medical workers were recorded, resulting in the deaths of at least 106 medics, 33 of whom died on the job, and 52 injured [8]. It must be said that in the frontline regions, an extremely difficult situation has developed with regard to the provision with medical personnel, which, together with the above-mentioned factors, definitely affects the availability and quality of medical care for children and adults. At present, the situation in the frontline regions has definitely worsened due to the transfer of medical staff to other regions of Ukraine and their emigration. This



Figure 1. A children's hospital in Mariupol was destroyed as a result of a Russian airstrike (www.pravda.com.ua/news/2022.03.9.7329805)

calls for special measures to ensure medical care for children in these conditions, namely volunteering and sending medical staff to work in these regions on a temporary basis.

Paediatricians from the departments of the Bogomolets National Medical University in Kyiv are also involved in volunteer work. They travel to the frontline regions to examine and treat children whose families have not been able to evacuate for one reason or another. An essential part of this work is providing humanitarian aid (food, clothing, medicines, nursing supplies) in conditions of ongoing hostilities. Complex cases and work with children who have suffered as a result of Russian aggression are the subject of our collaboration with paediatricians from Medical University of Warsaw.

Virtual telemedicine has become an important part of the work of Ukrainian doctors, especially in the frontline and liberated areas where there is no access to the usual wide range of specialists. Advice is provided on bomb injuries, burns, children's illnesses and nutritional problems. For example, the Department of Paediatrics at Bogomolets National Medical University in Kyiv has set up a unique Telegram channel to provide online advice to sick children.

According to the Ukrainian government, more than 800,000 homes have been damaged or destroyed in the country since the start of the war, and thousands of people are now living either in dormitories or in destroyed homes without the necessary protection from the harsh cold. As we have seen, the use of wood as a fuel by the population out of necessity increases the risk of respiratory disease in children and carbon monoxide poisoning in entire families.

Another serious threat to public health is the problem of immunisation. Given the low level of vaccination of the

Ukrainian population against COVID-19 and other infectious diseases, currently less than 80 %, and the fact that many children have not received routine vaccinations due to the war, an epidemic of measles and diphtheria is expected soon.

From October 2022 to March 2023, there are significant power and heat disruptions caused by missiles targeting critical civilian infrastructure and energy sources. As a result of the energy disruptions, online education will be denied, so children will return to physical schooling. During air raid alerts, students are forced to stay in the basements of schools that have been converted into temporary shelters. In Kyiv alone, we have seen that during air raids and shelling, up to 200–400 schoolchildren can be housed in such rooms for 1–5 hours at a time, depending on the duration of the air raid. As a result, we are already seeing an increase in acute viral respiratory infections, asthma exacerbations and panic attacks in children.

In addition to the typical paediatrician visits at this time of year in the frontline areas, associated with fever, cough and other symptoms of acute respiratory infection, up to a third of the children we interviewed complained of chronic gastrointestinal symptoms and chronic abdominal pain, probably related to nutritional factors, mainly lack of regular meals and access to hot food (Fig. 2).

The situation with regard to dental care for children has deteriorated, resulting in an increase in the prevalence of tooth decay (more than 70 % of cases) and allergic lesions of the oral mucosa, which may be linked to the irrational and poor quality of food in wartime conditions, hypovitaminosis and a polluted environment.

We also focused on chronic diseases, particularly asthma and other allergic diseases. Among the children seen in the

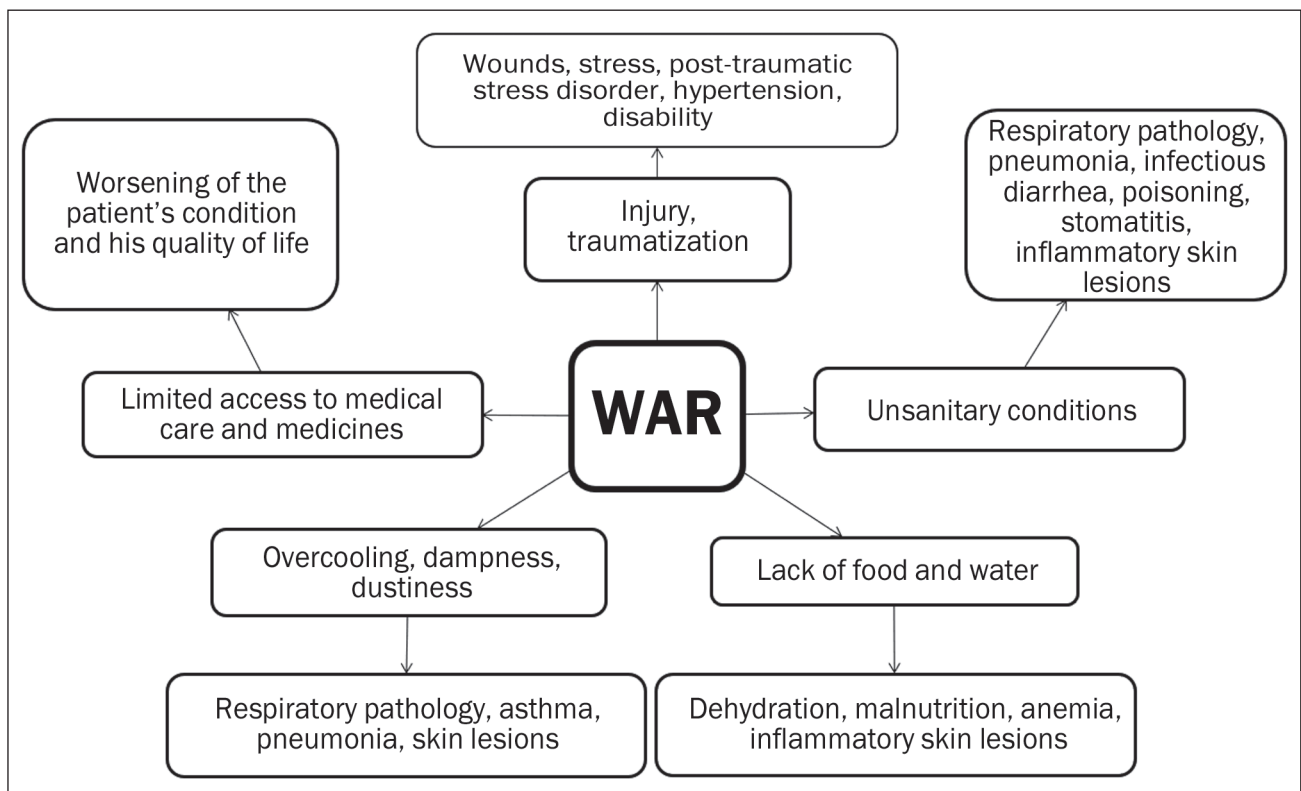


Figure 2. The impact of the consequences of war on children's health

refugee centres, we noted a significant deterioration in the health status of those with asthma, most likely due to the following reasons:

- internally displaced persons have difficult access to health care and poor disease surveillance. In particular, in many regions these children do not have access to a paediatric allergist, diagnostic procedures (spirometry, peak flowmetry, allergy testing);

- difficult access to medicines and inhalers. Younger children receive inhalation therapy through a nebuliser at home. With no other means of inhalation and no electricity, these children do not receive treatment, which is life-threatening;

- staying in a crowded room contributes to being infected with the virus;

- staying in the basement — the shelter promotes sensitisation to mould and pets in people who are susceptible, and aggravates allergies in children who are already sensitised;

- exposure to combustion products, chemical emissions;

- prolonged stay in cold rooms became a heavy burden with the onset of cold, wet weather combined with Russian missile strikes on civilian infrastructure and energy supply facilities, and lack of heating in homes.

Significant harm also occurs in the care of children with chronic illnesses due to limited access to specialised care and diagnostic procedures, and limited access to medicines and inhalers. Younger children who receive inhalation therapy at home with a nebuliser cannot receive it due to lack of electricity. We have observed that children in basement shelters are more likely to be exposed to unwanted allergens, and that exposure to smoke from chemical explosions and emissions aggravates symptoms of pre-existing chronic diseases.

Unfortunately, medical information about children is often lost when families with children are evacuated from areas of active hostilities. As a result, when working with chronically ill children, the only information available to make clinical decisions is the words of their parents or guardians.

Failure to meet a child's basic needs for food, exercise, warmth and care leads to rapid exhaustion of their physical and mental capabilities. It slows down physical development while artificially accelerating the mental process of growing up. As a result of the war, the child loses its childhood. And this cognitive-physical dissonance destroys the child's "cocoon of safety". It leads to several negative health consequences because the child is not ready to accept such a cruel reality. More than 50 % of the Ukrainian children we interviewed during the bombing visits suffer from some form of depression and require psychological treatment.

Such exhaustion leads to both psychological disorders (post-traumatic stress disorder, neuroses, accentuations, impaired productive communication with the world) and various psychosomatic disorders (reduced cognitive functions, somatoform autonomic disorders, etc.).

This confirms our earlier observations in 2020 in the eastern regions of Ukraine, where hostilities have been ongoing since 2014. We found higher rates of both prevalence and incidence of epilepsy, infectious diseases, respiratory

diseases, bronchial asthma, pneumonia, cardiovascular diseases and cancer than the national rates. It should be noted that children from the zone of armed conflict in the Donetsk and Luhansk regions had higher rates of both prevalence and incidence of mental and behavioural disorders than national ones ($p < 0.05$) [9]. Children living in the frontline zone, suffering from constant Russian shelling, lack of food, heating, communication and education, begin to perceive the situation as normal on a subconscious level, with a corresponding change in emotional reactions due to their regression [10].

We believe it is a consequence of the constant stress these children are under as a result of the ongoing war. This could manifest itself in the form of non-psychotic mental disorders, primarily disorders of psychological development, autism spectrum disorders and epilepsy.

In the conditions of a shortage of medical personnel, equipment and medicines, all of the above requires significant efforts of the medical care system of Ukraine in order to preserve the health of children who are suffering due to the ongoing war.

Conclusions

In the new conditions of warfare, where civilians and life support infrastructure have become the target of armed attacks, children have become the most vulnerable group.

A rapid increase in the incidence of respiratory pathology and stress disorders at the beginning of 2023 may become a special problem for Ukrainian paediatricians. The issues of restoration of full medical care for children, including emergency and urgent care by doctors of certain paediatric specialties, full supply of medicines and medical products, and restoration of the destroyed medical infrastructure remain extremely relevant for the health care system in the frontline and liberated areas.

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Проблеми надання медичної допомоги дітям України внаслідок російської агресії

Резюме. Актуальність. Російська агресія призвела до численних жертв серед мирного українського населення, зокрема дітей. Військові дії прямо або опосередковано призводять до зростання захворюваності дорослого й дитячого населення, хронічного стресу, особливо в дітей, що не має рішення. **Метою** цього дослідження є аналіз стану та проблем надання медичної допомоги дітям України, які найбільше страждають від багатofакторних наслідків війни. **Матеріали та методи.** Використані дані офіційної статистики та власні дані спостережень за період 2022–2023 років. **Результати.** Нині понад 7,5 мільйона українських дітей потерпають від війни не лише через тілесні ушкодження і хвороби, а й порушення психічного та психоемоційного стану. Особливою проблемою для українських педіатрів на початку 2023 року стало зростання захворюваності дітей на гостру респіраторну патологію, COVID-19 та стресові розлади в умовах дефіциту медичного персоналу та інфраструктури. Також за обмеженої доступності до медич-

ної допомоги й ліків необхідно приділяти увагу хронічним захворюванням, зокрема астмі та іншим алергічним захворюванням. У волонтерській допомозі дітям прифронтових регіонів беруть участь педіатри кафедр Національного медичного університету імені О.О. Богомольця. **Висновки.** У нових умовах ведення війни, коли об'єктами збройних нападів росіян є цивільні особи та інфраструктура життєзабезпечення, діти стали найбільш вразливою групою. Питання відновлення повноцінної медичної допомоги дітям, у тому числі екстреної та невідкладної, забезпеченість лікарями певних педіатричних спеціальностей, повного забезпечення медикаментами та виробами медичного призначення, відновлення зруйнованої медичної інфраструктури залишаються надзвичайно актуальними для системи охорони здоров'я прифронтової та звільненої території.

Ключові слова: Україна; діти; російська агресія; медична допомога