

МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ НАЦІОНАЛЬНИЙ
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КАФЕДРА ПРОМИСЛОВОЇ ТЕХНОЛОГІЇ ЛІКІВ ТА КОСМЕТИЧНИХ
ЗАСОБІВ КАФЕДРА АПТЕЧНОЇ ТЕХНОЛОГІЇ ЛІКІВ

MINISTRY OF HEALTH OF UKRAINE
NATIONAL UNIVERSITY OF PHARMACY
DEPARTMENT OF INDUSTRIAL TECHNOLOGY OF MEDICINES AND
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PRE-FILLED SYRINGES ON THE UKRAINIAN MARKET

Bobrytska L.O., Hrytsenko V.I., Petrovska L.S., Kovalov V.V.

Industrial Technology of Medicines and Cosmetics

National University of Pharmacy, Kharkiv, Ukraine

volodyakw@gmail.com

Introduction. Rapid, timely, and high-quality provision of emergency medical care is a pressing issue in modern pharmacy, particularly under conditions of martial law. Parenteral administration of pharmaceutical products is one of the most widely used methods due to its rapid onset of action and 100% bioavailability. However, the main challenges of parenteral drug delivery include limited convenience, accessibility, dosing accuracy, sterility, and safety. These drawbacks make this delivery system less desirable in certain situations. Therefore, many of these limitations can be effectively overcome through the use of prefilled syringes.

Under current conditions of military operations and in emergency situations such as disasters, terrorist attacks, or exposure to chemical warfare agents, the speed, safety, and efficiency of medical care become critically important. Medicinal products contained in prefilled syringes can function as “devices” intended for intramuscular administration during self-aid or buddy-aid on the battlefield. As an innovative drug delivery system, prefilled syringes address key challenges associated with parenteral drug administration, including the need to maintain sterility, ensure dosing accuracy, and enable rapid administration. Their use in field conditions significantly reduces the time between injury and the administration of critical medications (e.g., analgesics, antidotes, and hemostatic agents), which is a decisive factor in preserving the life and health of military personnel.

Important advantages of this system include ease of use in conditions with limited access to medical equipment, the possibility of self-administration or assistance to a wounded comrade, and the minimization of risks associated with errors during medication preparation. Considering the high level of standardization and the wide

Analysis of the assortment of drugs in pre-filled syringes showed that foreign-made drugs prevail in the pharmaceutical market of Ukraine. The ratio of domestic - 7.5% and imported drugs - 92.5%.

Domestic drugs represented by 5 national manufacturers are shown in Fig. 1, where the largest share of the drug market (40.9%) belongs to LLC “FZ “Biopharma” (Bila Tserkva), which produces 9 items, LLC “Pharmex Group” (Boryspil) – 5 items (22.7%) and JSC “Farmak” (Kyiv) – 4 items (18.2%).



Fig. 1. Number of Ukrainian medicines in pre-filled syringes by manufacturers

The distribution of the number of registered drugs in pre-filled syringes by country of origin is shown in Fig. 2.

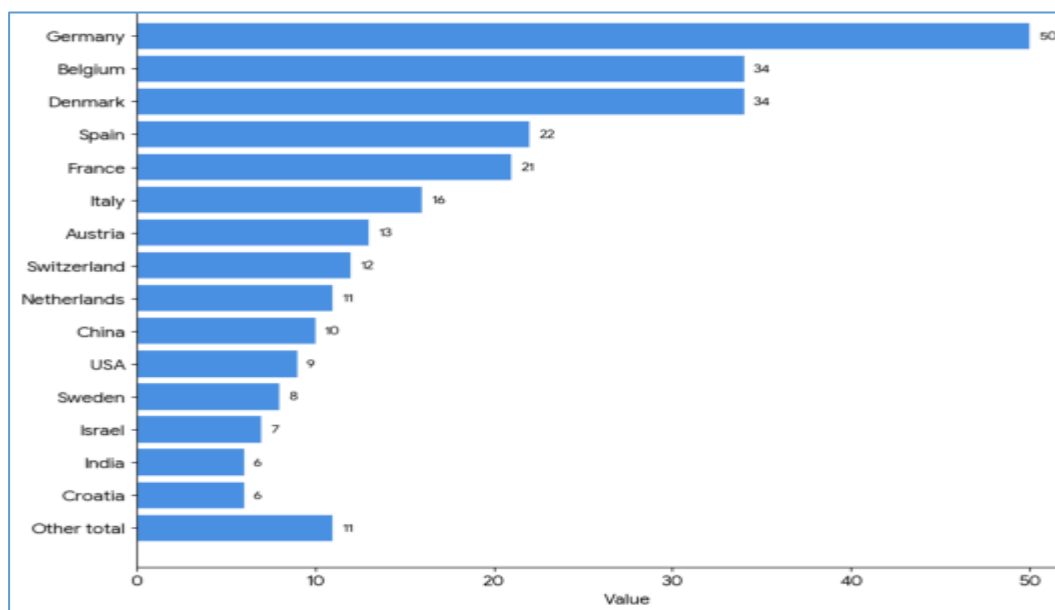


Fig. 2. Number of foreign countries producing medicines in pre-filled syringes

Among foreign-produced drugs on the market, drugs from Germany (50 drug names, 18.5% of the total number of drugs) prevail, as well as those produced in Belgium (34 drug names, 12.5%), Denmark (34 names, 12.5%, respectively).

The global prefilled syringe market size in 2021 was USD 3,591 million. An average annual growth of 7.1% is projected until 2030. The major driving factors for the prefilled syringe market are the increasing prevalence of various chronic diseases such as diabetes, cancer, hormonal disorders, and others. The rapidly increasing prevalence of various diseases has increased the demand for better treatment options and ultimately supported the growth of the prefilled syringe market size. In addition, increasing healthcare expenditure, increasing government support, and increasing population preference for vaccines have contributed to the growth of the prefilled syringe market value.

The prefilled syringe market is segmented based on delivery method, barrel type, product type, application, and geographical region. By delivery method, it is divided into: subcutaneous, intramuscular, intravenous. By barrel type: dual-chamber, individual prefilled syringes, single-chamber. By Product Type: Plastic-based and Glass-based Prefilled Syringes. In the pharmaceutical market, the share of glass prefilled syringes is about 95%.

Some of the prominent global companies in the safe prefilled syringes market are: Schott AG, Gerresheimer AG, West Pharmaceutical Services, Inc., Becton, Dickinson and Company, Vetter Pharma International GmbH, Catalent, Inc., Weigao Group, OMPI (A Stevanato Group Company), Nipro Corporation, and Medpro Inc.

The production of prefilled syringes is carried out on modern automated filling and capping systems that reduce the risks of operator involvement. Automated lines allow for efficiency, accuracy, flexibility, and strict compliance with GMP requirements.

Therefore, due to their convenience and ease of use, pre-filled syringes are ideal for self-help and battlefield assistance, making them an integral part of modern first aid

kits. The introduction of such systems into field medicine is a promising direction for increasing the efficiency of medical support for military personnel.

Conclusions

1. Pre-filled syringes are an important tool for the effective provision of emergency medical care in combat conditions, ensuring speed, accuracy of dosing and sterility. Their use in the Armed Forces of Ukraine allows for the prompt administration of critical drugs (painkillers, antidotes, hemostatic agents), reducing the risk of complications and increasing the chances of survival of the wounded.

2. According to research by marketing companies around the world, pre-filled syringes are used for vaccines, biotechnological products, medicines for providing emergency medical care, as well as in cosmetology.

3. As a result of the marketing analysis, 292 medicines in pre-filled syringes are registered in Ukraine. The ratio of domestic and imported drugs is 7.5%: 92.5%, respectively.

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INTEGRATED CHEMICAL AND BIOLOGICAL ASSESSMENT OF *RHODODENDRON TOMENTOSUM* HARMAJA EXTRACTS

Halyna Kukhtenko^{1,2}, Izabela Jasicka-Misiak¹*

¹Department of Pharmacy and Ecological Chemistry, Institute of
Chemistry, University of Opole, Opole, Poland

²Department of Industrial Technology of Medicines and Cosmetics,
National University of Pharmacy, Kharkiv, Ukraine

e-mail*: galinakukh@gmail.com

Introduction: Medicinal plants are valuable sources of biologically active compounds widely used in pharmaceutical and cosmetic formulations. *Rhododendron tomentosum* Harmaja is known for its rich phytochemical composition, including essential oils, phenolic compounds, and other secondary metabolites with potential biological activity.