



Istorija farmacije

History of Pharmacy



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EVROPSKA FARMAKOPEJA KROZ ISTORIJU: ULOGA SRBIJE

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Za razliku od gradskih ili službenih farmakopeja iz srednjeg veka, regionalne farmakopeje su u Evropi uvedene kasno. Termin Farmakopeja je uveden 1561. godine, ali je opštu primenu dobio u 17. veku. Evropska farmakopeja (Ph. Eur.) je zakonska i naučna osnova za kontrolu kvaliteta lekova u Evropi. Njen rad koordiniše Evropski Direktorat za kvalitet lekova i zdravstvenu zaštitu (EDQM) u Strazburu, preko radnih grupa eksperata iz država članica koje su potpisale konvenciju o izradi Ph. Eur. Cilj istraživanja je bio da prikazemo istorijske podatke o osnivanju Ph. Eur. sa posebnim osvrtom na ulogu Srbije.

U okviru ovog rada, sprovedeno je pretraživanje istorijskih podataka i zakonskih odredbi sa ciljem pronalaženja činjenica o osnivanju, razvoju i aktivnostima Ph. Eur., i ulozi Srbije u radu Ph. Eur. Konvencija o izradi Ph. Eur. je usvojena 1964. godine, i ratifikovana od strane 8 zemalja do 1966. godine. Uredbom 75/318/EEC iz 1975., obavezna je usklađenost sa monografijama Ph. Eur. prilikom dobijanja dozvole leka za humanu upotrebu, a 1981., za veterinarske lekove. Evropski direktorat za kvalitet lekova (EDQM) je osnovan 1996. Uredbe 2001/82/EC i 2001/83/EC za lekove za humanu i veterinarsku upotrebu su usvojene 2001. godine, sa zadržanom obavezom usklađenosti sa monografijama Ph. Eur. kod dobijanja dozvole za lek. Do 2018., 38 evropskih zemalja kao i Evropska unija su ratifikovale konvenciju o izradi Ph. Eur. Postoji i 30 posmatrača. Srbija je ratifikovala konvenciju 28.02.2001.godine. Od 2004., delegacija Srbije učestvuje na sastancima Komisije Ph. Eur. i ima eksperte u 5 radnih grupa koje razvijaju monografije Ph. Eur. u nacionalnoj kontrolnoj laboratoriji Agencije za lekove i medicinska sredstva Srbije. Dosad, eksperti Srbije su razvili 7 monografija.

Uspostavljanjem striktno regulatorne mreže evropskih zdravstvenih autoriteta, kroz monografije Ph. Eur., pacijentima su dostupni bezbedni, efikasni i kvalitetni lekovi. U poslednjih 15 godina, Srbija aktivno učestvuje u radu Ph. Eur, i doprinosi održanju javnog zdravlja.

Dušanka Krajnović je ovo istraživanje realizovala u okviru Projekta 14004 finansiranog od Ministarstva prosvete, nauke i tehnološkog razvoja Republike Srbije.

HISTORY OF EUROPEAN PHARMACOPOEIA: THE ROLE OF SERBIA

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Although city or municipal pharmacopoeias have history since middle age, regional approach was introduced lately in Europe. The term Pharmacopoeia was introduced in 1561, but used generally in 17th century. European Pharmacopoeia (Ph. Eur.) is legal and scientific base for quality control of medicines in Europe. Its work is managed by European Directorate for the Quality of Medicines & Healthcare (EDQM) in Strasbourg, by working groups of experts from countries that signed Ph. Eur. convention. The aim of the study was to represent historical data about establishment of Ph. Eur. with focus on the role of Serbia. Search of historical data and legislative rules has been performed to reflect on the establishment and development of Ph. Eur., its activities and role of Serbia in Ph. Eur.

Convention of elaboration of Ph. Eur. was adopted in 1964, and ratified by 8 countries to 1966. In 1975, Council Directive 75/318/EEC made compliance with Ph. Eur. monographs mandatory for marketing authorization of human medicines, in 1981, for veterinary medicines. In 1996, EDQM was established. In 2001, Directives 2001/82/EC and 2001/83/EC on medicines for human and veterinary use were adopted, keeping mandatory character of Ph. Eur. for marketing authorization. In 2018, 38 countries from Europe including European Union ratified convention. There are 30 observers. Serbia ratified convention on 28.02.2001. From 2004, delegation of Serbia participates in Ph. Eur. Commission, and has experts in 5 groups working on elaboration of monographs in national control laboratory of Medicines and Medical Devices Agency of Serbia. So far, Serbian experts have elaborated 7 Ph. Eur. monographs.

By establishing strict regulatory framework among European health authorities, through monographs of Ph. Eur., safe, effective and quality medicines are available to patients. In the past 15 years, Serbia has actively participated in work of Ph. Eur., thus contributing to public health maintenance.

The work of Dušanka Krajnović is partially supported by the grant of Ministry of Education, Science and Technological Development in Serbia, Grant Number 41004.

RAZVOJ JAVNO-APOTEKARSKE SLUŽBE U SUBOTICI TOKOM DRUGE POLOVINE XX VEKA

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Subotica je početkom XX veka, doživela i trgovački i „zdravstveni” procvat sa ukupno sedam privatnih javnih apoteka, a sa daljim razvojem i povećanjem broja stanovnika, počinje ubrzano otvaranje novih apoteka, čak i u prigradskim naseljima (Palić 1903) i seoskim sredinama (Stari Žednik 1906). Cilj rada je bio da istražimo razvoj apotekarske službe u Subotici, sa posebnim fokusom na apotekarsku ustanovu u Subotici koja baštini najdužu tradiciju apotekarstva još od XVIII veka.

Podaci su prikupljeni pregledom literature i arhivskog materijala. Primenili smo metodu istorijske analize za period od druge polovine XX veka do danas.

Neposredno pred II Svetskog rata u Subotici je radilo 16 privatnih javnih apoteka, koje nakon rata postaju narodne apoteke. U istoriji ovih apoteka tokom druge polovine XX veka, hronološki mogu da se izdvoje sledeći događaji:

- 1962. osnovana je Zdravstvena ustanova - Narodna apoteka Subotica
- 1974. Narodna apoteka Subotica postaje OOUR Medicinskog centra u Subotici, a bolnička apoteka se pripaja OOUR-u Apoteka
- 1993. Apoteka se izdvaja iz Medicinskog centra i postaje: Zdravstvena ustanova Apoteka
- 1998. Vlada Republike Srbije – Ministarstvo zdravlja, preuzima Zdravstvenu ustanovu Apoteka i menja njen naziv u Apoteka Subotica.

Osnivačka prava nad Apotekom Subotica 01. januara 2007. godine preuzima Opština Subotica. Danas ova ustanova obuhvata 22 organizacione jedinice-ogranaka (trinaest na teritoriji grada, i devet u prigradskim i seoskim delovima) i razvija nov i moderan pristup u sprovođenju farmaceutske usluge u oblasti medicinske zaštite i javnog zdravlja.

Tokom 230 godina istorije najstarije javno-zdravstvene apotekarske ustanove u Subotici sjedinili su se poverenje, struka i umetnost u nastojanjima da se unapredi kvalitet usluge i zadovolje potrebe pacijenata, ali i očuva profesionalni ugled apotekarskog staleža, estetika identiteta apoteke, kao mesta gde se uvek može dobiti tačan savet, kvalitetna usluga i efikasan lek.

Dušanka Krajnović je ovo istraživanje realizovala u okviru Projekta 14004 finansiranog od Ministarstva prosvete, nauke i tehnološkog razvoja Republike Srbije.

DEVELOPMENT OF THE PUBLIC PHARMACY SERVICE IN SUBOTICA DURING THE SECOND HALF OF THE 20TH CENTURY

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At the beginning of the 20th century, development and increase in the number of inhabitants began to accelerate the opening of new pharmacies in Subotica, as well as in the suburbs (Palic 1903) and rural areas (Stari Zednik 1906). The aim of this paper was to explore the development of pharmacy service, with a special focus on Subotica Pharmacy, which has the longest tradition since 18th century.

The data were collected by reviewing the literature and archival material. We have applied the method of historical analysis for the period from the second half of the 20th century to the present.

Before World War II in Subotica worked 16 pharmacies, which after the war became national pharmacies. The following events can be distinguished chronologically:

- In 1962, a health institution was founded - „The National Pharmacy Subotica”
- In 1974, The National Pharmacy Subotica became OOUR Medical Center in Subotica, and hospital pharmacy joined OOUR Pharmacy
- In 1993, The Pharmacy was separated from the Medical Center and became: Health Institution Pharmacy
- In 1998, The Government of the Republic of Serbia - the Ministry of Health, took over the Health Care Institute of Pharmacy and changed its name to Pharmacy Subotica.

Founding rights over Pharmacy Subotica on January 1st, 2007 is taken over by the Municipality of Subotica. Pharmacy Subotica consists of 22 pharmacies (13 on the territory of the city and 9 in the suburban and rural communities) and develops a new modern approach to the implementation of pharmaceutical services in the field of medical and public health.

In the 230 years of history, the oldest public health pharmacy institution in Subotica united confidence, profession and art in efforts to improve the quality of services and patients needs, preserve the reputation of pharmacy profession and aesthetics of pharmacy's identity as a place where everyone can get a right advice, a quality service and an effective drug.

The work of Dušanka Krajnović is partially supported by the grant of Ministry of Education, Science and Technological Development in Serbia, Grant Number 41004.

DOKUMENT O REVIZIJI PRVE KRUŠEVAČKE APOTEKE IZ 1886 - SVEDOČANSTVO O KVALITETU RADA FARMACEUTA DRAGOSLAVA KEDROVIĆA

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Sve apoteke koje su se otvarale u Srbiji u XIX veku bile su podvrgnute strogim zakonskim propisima, prema kojima su se uređivale, otvarale, nadzirao kvalitet rada u njima i poslovanje apotekara. Revizije apoteka uglavnom su sprovodili lekari ili državni hemičari. Cilj nam je bio da izložimo jedan od prvih sačuvanih dokumenata o reviziji apoteke - „Revizija apoteke g. Dragoslava Kedrovića u Kruševcu”. Uvidom u ovaj dokument, dolazi se do brojnih saznanja o regulisanju rada apotekarske delatnosti u Srbiji sredinom XIX veka. Primenjena je metoda istorijske analize, pregledom literature i arhivskog materijala, pri čemu su korišćeni i primarni i sekundarni izvori.

Revizija apoteke Mr pharm. Dragoslava Kedrovića u Kruševcu obavljena je 1886. godine po nalogu Ministra unutrašnjih dela (1886) SN 5558. Reviziju je izvršio doktor hemije Ferdinand Šams, tada državni hemičar, a trajala je šest dana. Tom prilikom sačuvan je originalni dokument. Najveći deo izveštaja revizor je posvetio pregledu lokala i pribora. Interesantan je opis oficine koja se u duhu toga vremena zvala „dućan”. Iz dokumenta se saznaje o apotekarskom priboru i posudu koje je korišćeno, a za koje se revizor pohvalno izrazio da je bio prisutan u dovoljnoj količini. Organizacija u apoteci bila je u skladu sa tadašnjim važećim propisima evropskih zemalja, a raspored skladištenja lekova u oficini je pravilan, pregledan i racionalan. Lekovi narkotični, merkurijalni, arsenikalni i drugi, jakog dejstva, odvojeni su sasvim od drugih. Posle pregleda svih droga, pristupljeno je pregledu svih farmaceutskih preparata. Revizor se veoma pohvalno izrazio o stručnom radu Kedrovića, naglašavajući u svom izveštaju da su svi farmaceutski preparati odgovarali propisima uzakonjene farmakopeje.

Možemo zaključiti da navedeni dokument predstavlja dragoceno svedočanstvo o razvoju farmacije u našim krajevima i dokaz da su se sredinom XIX veka u prvim srpskim apotekama primenjivala dostignuća evropske farmacije, kako u regulatornom, tako i u praktičnom smislu.

THE DOCUMENT OF INSPECTION OF THE FIRST PHARMACY IN KRUŠEVAC IN 1886 – THE EVIDENCE OF THE SUCCESSFUL PROFESSIONAL WORK OF DRAGOSLAV KEDROVIĆ

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All the pharmacies opened in Serbia in the 19th century had to comply with very strict legal regulations meeting the requirements which determined the terms of their opening, work organisation, monitoring and supervision of both the pharmacies and the pharmacists employed. The inspections of the pharmacies were mostly conducted by doctors or chemists appointed by the state. The aim of this paper is to present one of the first documents preserved on the inspections of pharmacies owned by Dragoslav Kedrović from Kruševac. By the insight into the document there were a lot of information about the regulations of pharmacies in Serbia in the mid-nineteenth century. The method of historical analysis was applied by using both the primary and secondary sources while reviewing the available literature and archive materials.

The inspection of Dragoslav Kedrović's pharmacy was carried out in Kruševac in 1886 by the order of the Ministry of Internal Affairs of Serbia (1886, SN 5558). It was conducted in six days by Mr Ferdinand Shams, doctor of chemistry, and a state appointed chemist. The official document of the inspection was issued, which has been preserved to nowadays. Most of the records in the document are referred to the inspection of the pharmacy premises and the equipment used. Interesting descriptions of the oficina were found called „*dućan*” (meaning a shop or a store of that time). The organisation of the pharmacy was in accordance with the standards applied in other European countries. The order of the medicines and drugs in the pharmacy storage was proper, transparent and rational. The mercurial, arsenic and other highly effective drugs were completely separated from the others.

It conclusion, this document represents a valuable evidence of the development of pharmacy in Serbia. It also proved that the first Serbian pharmacies in the 19th century were organised and run in compliance with the European legislative regulations, standards and pharmaceutical practice.

SKORO TRI VEKA POSTOJANJA „APOTEKE NA STEPENICAMA” U VRŠCU

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Prva apoteka u Vršcu osnovana je 1784. i nazvana „Kod Spasitelja” po nazivu ulice u kojoj se nalazila - Spasiteljev sokak, a kasnije dobija nazive: „Apoteka na stepenicama”, „Velika apoteka” i „Druga narodna apoteka”. Do 1971. u njoj deluje apoteka. Zbog značaja za istoriju apotekarske delatnosti zgrada je 1970. stavljena pod zaštitu države i do danas je aktivna kao muzej. U istraživanju je korišćena metoda ručne dokumentacione analize 1^o i 2^o izvora podataka.

Zgrada, podignuta u drugoj polovini XVIII veka, po arhitektonskoj kompoziciji pripada klasicističkom stilu, a njen konstruktivni sklop je tipično barokni. Jedna je od najstarijih i najreprezentativnijih zgrada u Vršcu. Projektovana je namenski što dokazuje specifičan dvostruki tavan prilagođen za sortiranje, sušenje i obradu lekovitog bilja kao i prostorije namenjene za delatnost apoteke. Prvi naziv „Apoteka na stepenicama” bio je opis zgrade sa stepeništem prislonjenim na zapadnu fasadu, a drugi kasniji naziv „Velika lekarna” ukazivao je na njenu veličinu u odnosu na druge otvorene apoteke. Osnivač i vlasnik bio je Vencel Pelevan. Menjali su se vlasnici: Kramer, Heleport, Šilder, Hercog, Past, Bela Kihler i Aleksandar Šandor Jovanović. Apoteka je od poslednjeg vlasnika otkupljena 1949. i postaje „Druga narodna apoteka”. U oficini je sačuvan kompletan nameštaj i inventar. U ostalim prostorijama izložene su apotekarske posude, aparature, laboratorijsko posuđe, bogata zbirka knjiga vezana za apotekarstvo i fotografije. Od posebnog značaja su keramičke stojnice, ručna apotekarska vaga, velike stojnice za praškaste supstance sa original signaturama iz 1870., kutijice za pakovanje lekova, original recepti tadašnjih vlasnika, formulari računa za naplatu. Na primeru kontinuiteta rada jedne apoteke uočavamo da prezentovanje farmako-istorijskog nasleđa pokazuje javnosti značaj i ulogu farmaceuta u društvu, njihovo društveno-odgovorno poslovanje i javno zdravstvene aktivnosti. Tako podsećamo javnost na farmaceuta kao neizostavnog, izuzetno važnog i najdostupnijeg zdravstvenog radnika današnjice.

ALMOST THREE CENTURIES OF „PHARMACY ON THE STAIRS” IN VRŠAC

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The first pharmacy in Vršac, „At the Saviours”, was founded in 1784, named after the Saviours’ Street, and later renamed to: „The Pharmacy on the Stairs”, „The Big Pharmacy” and „The Second National Pharmacy”. Until 1971 it acted as a pharmacy. Because of its significance to the history of pharmacy, the building was placed under the country’s protection and is still a museum.

Manual document analysis of sources 1^o and 2^o was employed.

The building’s architectural style is typically baroque, dating back to the 18th century, making it one of the oldest and most representative buildings in Vršac. It was built with utility in mind, as shown by its specific double attic constructed for sorting, drying and processing herbs, and rooms meant for the pharmacy itself. The first name, „The Pharmacy on the Stairs”, was a description of the building’s West wall staircase, and the second name „The Big Pharmacy” pointed out its size compared to others, which had been opened by that point. The founder and owner was Vencel Pelevan. It changed its owners: Kramer, Heleport, Šilder, Hercog, Past, Bela Kihler and Aleksandar Šandor Jovanović. It was acquired from its last owner in 1949 and became „The Second National Pharmacy”. All the furniture and inventory was preserved in the office. Apothecary dishes, apparatus, laboratory dishes, a rich collection of pharmaceutical books and photographs are displayed in other rooms. Especially significant are ceramic stands, apothecary scales, bigger powder substance stands with original signatures from 1870, medicine boxes, original recipes, billing forms. On the example of this pharmacy we see that presenting pharmaco-historical heritage to the public shows the significance of pharmacists in society, their socially responsible business and public health activities. Hence, we remind the public about the pharmacist as an extremely important and most available health worker of today.

PORODICA JOVANOVIĆ IZ VRŠCA KAO PRIMER DRUŠTVENO-ODGOVORNIH FARMACEUTA

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Vršačka porodica Jovanović darovala je društvu izuzetne ljude. Sa jedne strane čuvenog slikara Paju, a sa druge, posebno značajne za farmaciju, Aleksandra i njegove sinove Dušana i Svetislava. Njihov uticaj je izražen ne samo u farmaciji, već i u društvu kao celini. Osvrtom na njihove živote utvrdićemo značaj ove analize. U istraživanju je korišćena metoda ručne dokumentacione analize 1° i 2° izvora podataka.

Aleksandar Šandor Jovanović (1868-1953) diplomirao je farmaciju na Univerzitetu u Budimpešti. Govorio je srpsko-hrvatski, nemački i mađarski jezik. U vladi 1919. dobija dužnost narodnog komesara za unutrašnje poslove. Promenom političkih prilika biva uhapšen i osuđen na višegodišnju zatvorsku kaznu. Posle izlaska iz zatvora 1928, kupuje apoteku „Kod Spasitelja” u Vršcu i u njoj radi. Bio je dobrotvor za siromašnu decu u osnovnim školama, „Đačku trpezu”, „Kolo srpskih sestara” i mnoge druge. U priložima za zimsku pomoć je među darodavcima sa najvećim prilogom. Njegovi sinovi Mr ph Dušan Jovanović (1916-2007) i Mr ph Svetislav Jovanović (1919-1998) nakon diplomiranja radili su kod oca u apoteci sve do 1944. kada stupaju u vojsku Jugoslavije. Za vreme rata apoteka je redovno davala sanitetski materijal, lekove i novčanu pomoć NOP-u i Partizanskom odredu. Dušan dobija čin kapetana i premeštaj na VMA u Beogradu. Napreduje do čina pukovnika. Postaje prvi doktor farmaceutskih nauka pri VMA 1956. Bio je načelnik, profesor u školi rezervnih oficira i saradnik iz oblasti bojnih otrova na Katedri za toksikologiju Farmaceutskog fakulteta u Beogradu. Patentirao je metodu za prečišćavanje vode i postupak dezinfekcije bočica za ishranu dece. Svetislav je takođe službovao u vojnoj farmaciji kao načelnik laboratorije za proizvodnju KETGUT-hirurškog konca. Kao čovek visoke etike, plemenitog duha i nezaboravni učitelj, više puta je bio odlikovan, pohvaljen i nagrađivan. Angažovanjem i postupcima tokom svojih profesionalnih života, Aleksandar i njegovi sinovi dali su izuzetan trajni doprinos za dobrobit struke i društva u celini.

JOVANOVIĆ FAMILY FROM VRŠAC AS AN EXAMPLE OF SOCIALLY RESPONSIBLE PHARMACISTS

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The Jovanović family from Vršac has given us extraordinary people. From the famous painter Paja, to pharmacists, Aleksandar and his sons Dušan and Svetislav. By examining the lives of these influential people, we will determine the significance of this analysis.

Manual documentation analysis of 1^o and 2^o sources was employed.

Aleksandar Šandor Jovanović (1868-1953) obtained a degree in pharmacy from the University of Budapest. He spoke Serbo-Croat, German and Hungarian. He was appointed national commissary for internal affairs in 1919. After political climate changes he was arrested and sentenced to prison. After being released in 1928, he bought the pharmacy „At the Saviours”, in Vršac and started working there. He was one of the largest donors of winter aid and benefactor of poor children in primary schools, „The Pupil’s Dinner Table”, „A Round of Serbian Sisters” etc. His sons, Dušan Jovanović (1916-2007) and Svetislav Jovanović (1919-1998), worked in their father’s pharmacy after graduation until 1944 when they joined the Yugoslav Army. During the war the pharmacy regularly supplied medical and financial aid to NOP and the partisan troops. Dušan received the rank of captain, was moved to the Military Medicine Academy in Belgrade and later promoted to colonel. He became the first doctor of pharmaceutical science at the Military Medicine Academy in 1956. He was director, reserve officer school professor and chemical weapons research associate at the Department of toxicology at the Faculty of Pharmacy in Belgrade. He patented a method of water purification and a procedure for disinfecting children’s feeding bottles. Svetislav also served in military pharmacy as chief of the KETGUT surgical thread production laboratory. As an ethical and beloved teacher, he won multiple prizes. By engagement and actions during their professional lives, Aleksandar and his sons gave a permanent contribution to the profession and our society.

PRVA APOTEKA U ŠAPCU KAO SIMBOL RAZVOJA ZDRAVSTVENE KULTURE TOGA GRADA

Danka Stanojlović

Apoteka „Vegafarma” Valjevo (Srbija)

Od tridesetih godina 19. veka Šabac brzo napreduje i prednjači u ekonomskom i kulturnom smislu. Sve je nametalo potrebu osnivanja zdravstvenih ustanova - bolnice i apoteke. Prva moderna apoteka otvorena u centralnoj Srbiji, osnovana je 1830. godine u Beogradu, dok je Šabac svoju prvu apoteku dobio dvadesetak godina kasnije i to iz četvrtog pokušaja.

U istraživanju je korišćena metoda ručne dokumentacione analize 2^o izvora podataka.

Pokušaj da se otvori savremena apoteka u Šapcu 1839. vezan je za Antona Delinija. Kako nije imao diplomu apotekara, dobio je dozvolu uz uslov da mora u apoteci imati magistra farmacije. Apoteka je delimično bila opremljena, ali sa radom nije počela, jer nije dobila odobrenje od okružnog fizikusa u Šapcu dr Antonija Grodera. Delini nedovršenu apoteku premešta u Beograd. Groder je štitio lične interese, imao je svoju priručnu apoteku, i sprečavao je otvaranje savremene apoteke, te su i pokušaji .mr ph. Avgusta Kozjaka 1846., i mr ph. Đorda Krstića 1851., ostali bezuspešni. Godine 1856. godine, 11. oktobra mr ph. Franc Ludvik, koji se kasnije pokrštava u Mijaila Filipovića, u tome uspeva. I otvorena je apoteka „Kod Sv. Trojice” pošto je pored mišljenja dr Grodera, svoje mišljenje dalo i Okružno načelstvo. Od 1894. godine, vlasnik prvoosnovane apoteke postaje mr ph. Gavrilo-Gaja Gašić, kupivši je od Milana Filipovića, sina i naslednika prvog šabackog apotekara. Gašić od 1924. apoteku izdaje pod zakup, a 1928. prodaje mr ph. Lazaru Laziću. Lazić proširuje apoteku koja radi kao privatna sve do 1949. kada sve apoteke prelaze u državno vlasništvo.

Upornošću apotekara koji su u Šapcu želeli da ostvare trajni boravak otvaranjem apoteke, Šabac se našao na četvrtom mestu u Srbiji. Da nije bilo prepreke u vidu lika okružnog fizikusa koji je svoje lične interese pretpostavio razvoju zdravstvene kulture, Šabac bi bio odmah iza Beograda u pogledu razvoja javnog zdravlja u Srbiji.

THE FIRST PHARMACY IN ŠABAC AS A SYMBOL OF HEALTH CULTURE PROGRESS OF THAT CITY

Danka Stanojlović

Pharmacy „Vegafarma“ Valjevo (Serbia)

Since the 1830s, Šabac has been developing rapidly in every sense. It has been competing with Belgrade in many areas. While the first modern pharmacy was founded in 1830 in Belgrade, the city of Šabac received its pharmacy only on the fourth attempt. Manual document analysis of 1° and 2° data sources was applied.

The attempt to open a modern pharmacy in 1839 was associated with Antonio Delini. As he had no degree in pharmacy, he got a permission only if he would employ a magister of pharmacy. The pharmacy was partly equipped, but it was not opened as it had not received an approval from Dr. Antonio Groder, a physician from Šabac, Delini moved his pharmacy to Belgrade. Mr ph. Avgust Kozjak and mr ph Đorđe Krstić failed in receiving the permits in 1846 and 1851 respectively. Dr. Groder prevented the founding of a modern pharmacy protecting his personal interests and having a medicine supply of his own. On 25th April in 1856, mr ph Franz Ludwig, later legally changed to Mijailo Filipović, came from Ilon intending to open a pharmacy and he did it on 11th October 1856. The „Holy Trinity“ was founded because of Dr. Groder's approval and the district authorities' opinion. In 1894, mr ph Gavriilo Gaja Gašić bought the pharmacy from Milan Filipović, the son and heir of the first pharmacist of Šabac. In 1924, he let the pharmacy and in 1928 he sold it to mr ph Lazar Lazić who expanded the pharmacy being privately owned until 1949, when all the pharmacies were nationalised.

The persistence of pharmacists looking for a permanent residence in Šabac by opening a pharmacy made the city of Šabac the 4th most developed city in Serbia. Without the setbacks of the district physician dr. Groder, the city of Šabac would have been the second after Belgrade in terms of public health development in Serbia.

DOPRINOS VELIMIRA KARIĆA RAZVOJU APOTEKARSKE SLUŽBE I FARMACEUTSKE PROFESIJE U SRBIJI NA PRELAZU IZMEĐU XIX I XX VEKA

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Osma decenija XIX veka u Srbiji bila je u znaku velikih političkih, društvenih i kulturnih promena koje su uticale na razvoj zdravstvenih prilika, što se odrazilo i na apotekarsku službu.

Cilj rada je da se prikaže doprinos apotekara Velimira Karića razvoju apotekarske službe i osnaživanju društvenog položaja apotekarskog staleža.

Korišćena je ručna dokumentaciona analiza primarnih i sekundarnih izvora podataka. Analizirani period obuhvata četiri decenije, od 1883. godine do tridesetih godina XX veka.

Velimir Karić završio je studije farmacije u Beču i 1883. godine dobio koncesiju za otvaranje prve apoteke u Vranju. Nakon trinaestogodišnje službe otvorio je petnaestu apoteku u Beogradu u kojoj je radio do 1924. godine, kada se penzionisao. Kao iskusan farmaceut bio je mentor mnogim apotekarskim saradnicima i mlađim kolegama koji su kod njega bili na pripravničkom stažu i obuci. U njegovoj apoteci su se izrađivali neki od poznatih apotekarskih specijaliteta, čiju recepturu je u duhu toga vremena apotekar čuvao kao najstrožiju profesionalnu tajnu. Uporedo sa farmaceutskom delatnošću, Karić je bio aktivan u najstarijem apotekarskom udruženju (Srpsko apotekarsko društvo) gde je bio predsednik u periodu od 1919. do 1924. godine. Zbog velikog profesionalnog angažovanja na jačanju i podizanju društvenog ugleda apotekara, kasnije je izabran za počasnog predsednika Društva. Zapažena je i njegova aktivnost za bolji položaj apotekara vlasnika kroz rad Apotekarske komore Kraljevine SHS. Iz svega iznetog možemo zaključiti da je celu svoju profesionalnu karijeru Velimir Karić, kao receptarijus u apoteci, posvetio unapređenju zdravlja građana, ali je istovremeno doprinio i podizanju ugleda apotekara u društvu, kao i očuvanju i jačanju staleških interesa.

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VELIMIR KARIC'S CONTRIBUTIONS TO THE DEVELOPMENT OF APOTHECARY SERVICES AND PHARMACY PROFESSION BETWEEN THE END OF XIX AND THE BEGINNING OF THE XX CENTURY

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The 1880s were known for tremendous political, social, and cultural changes that influence the development of health conditions undoubtedly reflected to apothecary services. This paper is aimed to analyse Velimir Karic's contribution to the development of apothecary services and strengthening the social status of pharmacy profession in Serbia. We used the manual documentary analysis of primary and secondary data sources. The analysed period covered four decades between 1883 and 1930s.

Velimir Karic completed his pharmacy studies in Vienna and in 1883 received a concession to open the first pharmacy in Vranje. After thirteen years of his professional activity, he opened the 15th pharmacy in Belgrade working there until his retirement in 1924. As he gained a great experience, he became a mentor to many pharmacy associates and younger colleagues who were at the internship and training sessions. In his pharmacy were made some of the well-known apothecary specialties of that time, and their prescriptions were kept by the pharmacist, in the spirit of that time, as a professional secret. Along with his pharmaceutical activity, Mr Karic actively took part in the oldest pharmacy association (Pharmacy Society of Serbia), where he was elected a president in the period between 1919 - 1924. For engaging in the strengthening of the social status of pharmacists, he was elected the Honorary President of the Society. His activity for an improved status of apothecary owners through the activities of the Apothecary Chamber of the Kingdom of Serbs, Croats and Slovenes was also remarked.

Velimir Karic dedicated his entire professional life to the improvement of health through public health activities in pharmacy, as well as through the contribution to the development of the pharmacists in the society and the preservation and strengthening of the interest of pharmacists.

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LEČENJE ŠUGE U BRANIČEVSKOM OKRUGU: NEKADA I SAD

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ZU Apoteka Požarevac (Srbija)

Na teritoriji Braničevskog okruga postoje arheološki, istorijski dokazi o izradi medikamenata. Danas je ZU Apoteka Požarevac dostojan naslednik antičke i nosilac savremene farmacije Braničevskog kraja i Srbije. Izrada lekova u apoteci za individualnu terapiju oduvek je bila prisutna, počev od doba lekaro-apotekara sve do savremene farmaceutske prakse. Kroz razvoj jednog magistralnog leka želeli smo da ukažemo na značaj izrade magistralnih preparata u terapiji šuge. Koristili smo metodu komparacije, a kao izvore podataka imali ručnu knjigu recepata „Manuel” apoteke „Kod Anđela” iz Velikog Gradišta iz 19. veka i knjigu za evidenciju izrađenih magistralnih lekova u ZU Apoteka Požarevac. Metodom otvorenog intervjua prikupili smo podatke o zadovoljstvu građana uslugom izrade magistralnih lekova za tretman šuge.

Uparednom analizom utvrdili smo da je aktivna supstanca za lečenje šuge sumpor, odnosno jedinjenja sumpora, koja su se primenjivala u obliku losiona i masti. Slično najstarijim analiziranim preskripcijama iz 19. veka i danas se preparati na bazi sumpora dominantno koriste u terapiji ovog infektivnog oboljenja. Utvrdili smo stalni porast magistralnih lekova za lečenje šuge u poslednjih 15. godina u državnim apotekama Braničevskog okruga. Na osnovu savremene stručne literature, 2017. godine farmaceuti Apoteke Požarevac predložili su dermatolozima Braničevskog okruga novu aktivnu supstancu - permetrin, u koncentraciji 5% u kremi kao farmaceutskom obliku. Uparednom analizom magistralnih preparata u vremenskom periodu od godinu dana od uvođenja permetrin 5% krema, uočen je pad broja izrađenih magistralnih lekova za lečenje šuge za 30%. U razgovoru sa pacijentima farmaceuti su došli do podataka o zadovoljstvu brzinom nestajanja simptoma bolesti, komforošću primene i cenom novog magistralnog leka za šugu. Konsultacije sa dermatolozima potvrdile su smanjenje broja obolelih od šuge, što ukazuje da je izrada magistralnih lekova i dalje veoma važna u terapiji šuge, kao i da nove aktivne supstance u magistralnim lekovima mogu značajno unaprediti tretman na zadovoljstvo kako samih pacijenata, tako i zdravstvenih radnika.

TREATMENT OF SCABIES AT BRANICEVO DISTRICT: ONCE AND NOWDAYS

Jelena Trifunović, Nikola Bošković, Nebojša Jorgovanović

ZU Pharmacy Požarevac (Serbia)

There are archaeological and historical evidences, at the territory of Branicevo district about compounding medicaments. Today, Pharmacy „Pozarevac” is a worthy successor of the ancient and a bearer of modern pharmacy at Branicevo region and Serbia. Compounding of medications at apothecary laboratory for an individual treatment has always been present, since a physician-apothecarists’ period to a modern pharmaceutical practice. Through the development of one magistral preparation we would like to point out the importance of extemporaneous compounding in scabies treatment. We used a comparative analysis of a handwritten book „Manuel” of Angel Pharmacy from Veliko Gradište since the 19th century and current records of the compounding medications in Pharmacy „Pozarevac”. We collected data by an open interview on the satisfaction of patients with compounded medicines. The results shown that nowadays medicaments based on sulphur are dominant in the treatment of scabies which is similar to the analyzed prescriptions from the 19th century. A constant increase in the number of extemporaneously compounded medicines applied as lotions or unguents for scabies treatment at the pharmacies of Branicevo district has been observed for the last 15 years.

Based on the contemporary professional literature, in 2017, a pharmacist of the pharmacy „Pozarevac” proposed to dermatologists a new active substance - permethrin, at a concentration of 5% in the cream as a pharmaceutical dosage form. One year after the introduction of permethrin 5% cream, a decrease of 30% of manufactured sulphur products for the diagnosis of scabies was observed. In conversations with patients, pharmacists learnt about satisfaction with the rate of disappearing symptoms of the disease, comfort of applications and price of the new compounded *medicine* for the treatment of scabies. Consultations with dermatologists confirmed a decrease of scabies cases, which can lead to conclusion that compounded *medicines* are still very important in the treatment of scabies, but also that new, active substances in magistral medicines can significantly improve treatments both with the satisfaction of patients and health care practitioners.

NAJSTARIJE SUBOTIČKE APOTEKE U XVIII I XIX VEKU

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Subotica je ukazom Marije Terezije dobila status Slobodnog Kraljevskog Grada (Maria Teresiopolis) 1779. godine, a nepunih godinu dana kasnije otvorena je prva apoteka. Cilj ovog istraživanja bio je da se sagleda rad prve dve gradske apoteke.

U radu je primenjena metoda istorijske analize kroz hronološki prikaz za period posmatranja od sedamdesetih godina XVIII veka do kraja XIX veka. Podaci su prikupljeni pregledom literature i arhivskog materijala.

Gradski senat u Subotici odobrio je 10. januara 1780. godine Čordi Ferencu osnivanje prve građanske apoteke „Mađarska Kruna” (Magyar Korona gyógyosztartar). Kako je on uživao veliki ugled, omogućene su mu prilične olakšice za rad i snabdevanje lekovima i sanitetskim materijalom. Svoju apoteku je preseljavao nekoliko puta, dok je zbog starosti nije prodao Arnu Mihalju 1804. godine. Skoro 33. godine nakon prve apoteke, u Subotici je 1813. godine Franc Ksaver Pešl dobio dozvolu za otvaranje druge apoteke, koju je nazvao „Pomozi Marijo”. Ona je, kao i prva, više puta menjala vlasnike, a početkom šezdesetih godina 19. veka nosila je naziv „Kod majke zaštitnice” i prešla u vlasništvo Ignaca Joa. Njegovi naslednici upravljali su njome sve do sredine poslednje decenije XIX veka, ali sa manje entuzijazma i uspeha, te je prodaju u zapuštenom stanju 1895. godine Ferencu Silberlajtneru. On je apoteku rekonstruisao, dopunio i proširio asortiman, a u apoteci je izrađivao i veliki broj magistralnih lekova i apotekarskih specijaliteta. Nameštaj koji je naručio za apoteku sačuvan je do današnjih dana i još uvek pleni svojom funkcionalnošću, skladom i umetničkom lepotom.

Prve subotičke apoteke i njihovi vlasnici, svi farmaceuti, odigrali su značajnu ulogu u očuvanju javnog zdravlja kroz dostupnost lekova kojima su redovno snabdevali građane, dominantno onima koje su izrađivali prema tadašnjim stručnim propisima.

THE OLDEST PHARMACIES IN SUBOTICA IN THE XVIII AND XIX CENTURY

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The city of Subotica was awarded in 1779 with the status of the Free Kingdom City (Maria Teresiopolis) by the sign of Maria Theresia. After almost a year, the first pharmacy was found. The aim of this study was to show the activity of the first two pharmacies in the Subotica area.

The method of historical analysis was applied. The data were collected by reviewing literature and archival material.

The City Senate approved to Corda Ferenz to establish the first pharmacy „Mađarska Kruna” (Magyar Korona Gyógyszertár) on 10th January 1780. As he had a great reputation he was given great working privileges in supplying drugs and sanitary material. He moved his pharmacy several times, but at least he had to sell it due to his oldness and inability. The owner became Arno Mihaly. All the owners had the academic degree of education. Almost 33 years after the foundation of the first pharmacy, a permission to open another pharmacy was given to Franz Xaver Pesl in 1813, and it was named „Pomozi Marijo”. The pharmacy changed its owners and at the beginning of the 1860s, it was owned by Ignàcz Joó, carrying a new name „Kod majke zaštitnice”. To the middle of the last decade of the 19th century, his inheritors manage the pharmacy, but with less enthusiasm and success. The pharmacy was finally sold in 1895 in a careless state to Franz Silberleithner. He completely reconstructed the pharmacy, extended the previous assortment of drugs and sanitary articles, and made there compounded drugs and apothecary specialities. The furniture that he ordered still captivates with its functionality, harmony and artistic beauty.

The first pharmacies in Subotica and their owners, as being pharmacists, played a crucial role in preserving public health due their availability and regular drug supplying of the citizens, mainly with the drugs manufactured according to the professional rules of the that times.

RAZVOJ APOTEKARSKE SLUŽBE NA PODRUČJU KIKINDE I SEVERNOG BANATA DO DRUGE POLOVINE 20. VEKA

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Apotekarska služba na području Kikinde i današnjeg Severnog Banata, kao i ostatku Vojvodine, imala je dug i dinamičan razvoj što je za posledicu imalo gustu mrežu apoteka na tim prostorima. U ovom radu prikazan je razvoj apotekarstva u Kikindi i severnom delu Banata pod Austrougarskom carevinom od 18. do početka 20. veka, kao i period nakon Prvog svetskog rata, odnosno vreme između dva rata, i period nakon završetka Drugog svetskog rata.

U radu je napravljen osvrt na hroniku apoteka ovog kraja, u smislu istorijskog razvoja u periodu dužem od 230 godina. Pioniri apotekarstva u Kikindi i Severnobanatskom okrugu ostavili su veliki trag na sredinu u kojoj su živeli i radili. Njihov značaj u očuvanju narodnog zdravlja je velik, a u tom smislu posebno se ističu: Dimitrije Paču, Franc Hajsler i Žigmund Fuks.

Apoteke su otvarane i radile po strogim zakonima i propisima koji su primenjivani u Evropi, a isto tako su bile strogo kontrolisane od strane državnih i stručnih organa. Zgrade i kuće u kojima su držali apoteke, postoje i danas, iako ne sve, kao podsećanje na prošlu epohu i njihov rad u širenju zdravstvene kulture ovog dela Vojvodine i Srbije. Apotekari su pokrenuli akciju sakupljanja dokumenata, knjiga, zapisa i drugih materijala kako bi se zabeležio razvoj profesije, ali je sve prekinuto izbijanjem Prvog svetskog rata, a kasnije su isti pokušaji sprečeni i Drugim svetskim ratom. Nakon stvaranja Jugoslavije 1945. godine, došlo je do velikih promena kada su apoteke na osnovu zakona o prinudnom otkupu prestale da budu privatne i kada su prešle u društveno vlasništvo kao narodne apoteke.

DEVELOPMENT OF PHARMACY SERVICE IN THE AREA OF KIKINDA AND NORTH BANAT UNTIL THE SECOND HALF OF THE 20TH CENTURY

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The pharmacy service in the area of Kikinda and today's North Banat, as well as the rest of Vojvodina, had a long and dynamic development resulting in a dense network of pharmacies. In this paper, the emphasis was on the development of pharmacy between the 18th and early 20th century in Austria and Hungary, or Austro-Hungarian Empire - a part of which was then the territory of today's Vojvodina with Kikinda and the northern part of Banat - as well as the period after the First World War, i.e. the interwar period, and the period after the end of the Second World War.

The paper deals with the chronicle of pharmacies of this region in terms of their historical development over a period of time more than 230 years. The pioneers of pharmacy profession in Kikinda and North Banat have left a great impact on the environment in which they lived and worked. Among them, there are especially distinguished personalities such as Dimitri Pachu, Franc Hysler and Zhigmund Fuks. Their contribution to public health was enormous.

The pharmacies of this region were opened and operated under the strict laws and regulations applied in Europe, and were also strictly controlled by the state and professional bodies. The buildings and houses where pharmacies were kept exist until nowadays (although not all) as a reminder of the past epoch and their contribution in spreading the health culture of this part of Vojvodina and Serbia. The shopkeepers have launched a campaign of collecting documents, books, records and other materials in order to record the historical development of pharmacy, but everything was interrupted by the outbreak of the World War I, and later the World War II.

After the Second World War, major changes took place when pharmacies were ceased to be private under the Law of Compulsory Purchase and when they became socially owned as national pharmacies.

FARMACIJA U SLUŽBI ZLA – KAKO SU „LEČILI” HITLERA I NEMAČKI NAROD U NACISTIČKOJ NEMAČKOJ

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Nacistička Nemačka je u mnogo čemu bila jedinstvena i pre svega negativna pojava u istoriji ljudske civilizacije. Manje pominjana sfera u kojoj su prednjačili je farmaceutska industrija, ali i upotreba opasnih i adiktivnih psihoaktivnih supstanci koje su koristili svi, počev od Firera – Adolfa Hitlera, do vojnika u rovovima i običnih građana. Cilj ovog rada je da se prikaže zloupotreba opoida koji izazivaju zavisnost u vreme nacističkog režima.

U cilju istraživanja, izvršen je uvid u veći broj publikacija i radova od početka 19. veka do današnjeg dana koji ukazuje na intrigantnu, mračnu stranicu istorije farmacije i prikazuju postepeni sunovrat kako Hitlera, ali i nemačke nacije u opštu zavisnost od tada dozvoljenih droga.

Od kada je nemački naučnik Fridrih Zetturner identifikovao morfin, 1804. godine i komercijalni patent kompanije Merck 1827. godine, Nemačka dobija svetski monopol nad opijatima koji se koriste u farmaceutskoj industriji, čiji je razvoj podržan tokom perioda militaristički nastrojenog nemačkog carstva 1860-1870-ih godina. Poražavajuće posledice Velikog rata, koji je ostavio za sobom milione osoba koje su patile od akutnih i hroničnih bolova i posttraumatskog stresa indukuju dodatna ulaganja u analgetike i sedative. Adolf Hitler na početku svoje političke karijere koristi radikalnu platformu protiv adiktivnih supstanci kako bi preuzeo kontrolu nad državom, Vajmarskom republikom, koja je u periodu 1919-1933. godine postala ekonomski zavisna od farmaceutskih proizvoda, naročito tada legalnog dostupnih kokaina i heroina. Ipak, sam Hitler vremenom postaje nevoljni zavisnik od istih tih supstanci, pod uticajem ličnog lekara Teodora Morela, a čitav narod deli njegovu sudbinu, naročito u pogledu metamfetamina (Pervitina®) koji se masovno primenjuje tokom Drugog svetskog rata.

Ovakve pojave su značajne za sociološka i historiografska proučavanja, ali predstavljaju i važno upozorenje da se pre svega sama farmaceutska struka i tako opasni proizvodi nikada više ne smeju zloupotrebiti na ovakav način.

PHARMACY IN THE SERVICE OF EVIL - HOW THEY „TREATED” HITLER AND THE WHOLE GERMAN NATION IN NAZI GERMANY

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Nazi Germany was unique and negative phenomenon in the history of human civilization. Less-known sphere in which they dominated was pharmaceutical industry, and the use of dangerous psychoactive substances taken by everyone, from Firer-Adolf Hitler to soldiers in trenches and ordinary citizens. This paper intends to show the abuse of opioid products that cause addiction during Nazi regime.

For the purpose of the research, an insight was made to a large number of publications and works from the beginning of the 19th century to the present day, which points to an intriguing, dark page of the history of pharmacy, showing a gradual collapse of Hitler and the German nation to overall dependence on then allowed drugs.

Since German scientist Friedrich Sertürner identified Morphine in 1804 and Merck's commercial patent in 1827, Germany had world monopoly on opiates for pharmaceutical industry, whose development was supported during the period of militaristic German empire from 1860s-1870s. The devastating consequences of the Great War - millions of people suffering from acute/chronic pain and posttraumatic stress, induce an additional investment in analgesics and sedatives. At the beginning of his political career, Adolf Hitler used a radical platform against addictive substances to take control of the Weimar Republic, which from 1919-1933 became economically dependent on pharmaceutical products, especially then legal cocaine and heroin. Still, Hitler himself, over time, became an unwilling addict to the same substances, under the influence of personal physician Theodore Morell, and the whole nation shares his fate, especially with regard to methamphetamine (Pervitina®) - massively applied during the Second World War.

Such phenomena are valuable for sociological and historiography studies, but also represent an important warning that, above all, pharmaceutical professions and these such dangerous medical products must never be abused in this way.

RAZVOJ LIPOSOMA: ISTORIJSKI PREGLED

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Liposome je prvi put predstavio A.D. Bangham 1965. godine, kada su oni prema njemu dobili naziv „bangosomi”. Godine 1981. on je predložio naziv „anfisomi” kao prikladniji termin, jer su molekuli koji čine membrane liposoma karakteristični amfifili. Međutim, kasnije su dobili naziv „liposomi”. Ukratko, liposomi su male, sferne vezikule, koje se sastoje od amfifilnih lipida, koji okružuju vodeno jezgro.

Cilj ove studije je bio da se sagleda razvoj u oblasti liposoma i kako su se menjale indikacije za njihovu primenu u farmaciji, medicini i šire.

Sprovedeno je istraživanje kroz obimnu i stalno rastuću oblast liposomologije u cilju sakupljanja podataka o različitim indikacijama za primenu liposoma

Pregled literature je pokazao da su liposomi ubrzo nakon otkrića, počeli da se koriste kao modeli bioloških membrana u mnogim granama biologije i medicine, usled sličnosti liposoma i ćelijskih membrana. Već 1986. godine kompanija Christian Dior SE (Francuska) plasirala je na tržište prvi kozmetički preparat sa liposomima, „anti-age” gel Capture™, a 1988. godine se na tržištu pojavio prvi liposomski dermalni preparat Pevaryl®-Lipogel sa ekonazolom (Cilag AG, Švajcarska). Potom su liposomi počeli da se koriste i šire u oblastima dijagnostike, imunomodulacije, genske terapije, onkologije, itd. Poslednjih godina oni se uglavnom koriste kao sistemi za isporuku lekova, tj. kao nanonosaci za različite lekovite supstance, koji se primenjuju lokalno ili sistemski (uglavnom intravenski). U liposome se mogu inkapsulirati i hidrofilne i lipofilne supstance. Postoje dve vrste liposomskih nosača: oni koje sadrže konvencionalne lekovite supstance male molekulske mase (npr. citostatike) i oni koji sadrže lekovite supstance veće molekulske mase (npr. oligonukleotide i plazmide DNK). Promenom lipidnog sastava, veličine čestica, naelektrisanja liposomskih membrana, kao i modifikovanjem njihove površine, mogu da se menjaju njihove fizičke osobine, čime može da se menja njihovo ponašanje *in vitro* i *in vivo*.

Iz svega iznetog može se zaključiti da je poslednjih godina značajno porasla primena liposoma kao sistema za isporuku aktivnih supstanci za različite indikacije.

EVELOPMENT OF LIPOSOMES: A HISTORICAL OVERVIEW

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Liposomes were first introduced by A.D. Bangham in 1965. Initially they were named after A.D. Bangham, „bangosomes”. Bangham proposed in 1981 the name „amphisome” as a more appropriate term since membrane molecules are characteristically amphiphiles. However, later they were termed „liposomes”. In brief, liposomes are small, spherical vesicles consisting of amphiphilic lipids, enclosing an aqueous core.

The aim of this study was to present the early development of liposomes and the way how the indications for liposomes use changed through years in the field of pharmacy, medicine, etc. A research through the extensive and ever increasing field of liposomology was performed in order to assemble different kinds of indications where liposomes found their application.

The literature overview revealed that liposomes have been used after their discovery as models of biological membranes in biology and medicine due to resemblance of liposomes to cell membranes. Already in 1986 the company Christian Dior SE (France) has launched the first cosmetic product with liposomes, the „anti-age” gel Capture™, while Cilag AG (Switzerland) launched in 1988 the first liposome dermal product Pevaryl®-Lipogel containing econazole. Afterwards they have started to be applied in the areas of diagnosis, immuno-modulation, gene therapy, oncology, etc. In last years they are mostly used as drug delivery systems i.e. carrier systems for different drugs, being applied topically or systemically (mostly intravenously). Liposomes may encapsulate hydrophilic and lipophilic substances. There are two very different classes of liposomal carrier systems: those containing conventional small molecular weight drugs (e.g. anticancer drugs) and those containing larger molecular weight (e.g. oligonucleotide and plasmid DNA) drugs. By varying lipid composition, particle size, net charge of liposome membranes, and modifying their surface, their physical properties can be changed as well as their behavior *in vitro* and *in vivo*.

It can be concluded that the use of liposomes as delivery systems for actives for different indications has gained in recent years considerable acceptance.

PRIKAZ AKCIJA DOBROVOLJNOG DAVANJA KRVI NA FARMACEUTSKOM FAKULTETU U BEOGRADU U PERIODU 2003 - 2018. GODINE

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Stalno samostalno i dobrovoljno angažovanje davalaca krvi neophodno je kako bi se obezbedile dovoljne količine krvi i krvnih derivata za svakodnevne potrebe. Problem nedovoljne količine krvi poprima svetske razmere. Studenti su potencijalni izvori dobrovoljnih davalaca krvi (DDK), kroz sam čin davanja i kroz motivisanje drugih kolega i sprovođenje promotivnih kampanja na fakultetima.

Ciljevi ovog rada su bili da se prikaže razvoj dobrovoljnog davalatstva krvi na Univerzitetu u Beogradu i analizira trend u broju dobrovoljnih davalaca na Farmaceutskom fakultetu u periodu od novembra 2003. do marta 2018. godine.

Podaci o ukupnom broju dobrovoljnih davaoca krvi na Farmaceutskom fakultetu u Beogradu dobijeni su iz baze Instituta za transfuziju krvi Srbije.

Akcije dobrovoljnog davanja krvi sprovode se u Beogradu od 1944. god., a organizovano na Beogradskom univerzitetu skoro dve decenije. Značajnu ulogu u pokretanju redovnih akcija dobrovoljnog davanja krvi imalo je društvo „Studenti davaoci krvi” formirano 2003. godine. Te godine prvi put su organizovane akcije DDK na fakultetima beogradskog Univerziteta. U toku posmatranih 15 godina, koliko se sprovode akcije na Farmaceutskom fakultetu, potencijalnih davalaca bilo je 2134, a ukupno je dalo krv 1819 davalaca. Najmanje potencijalnih davalaca bilo je u martu 2008. godine (36), a najviše u novembru 2013. godine (101). Gotovo dvostruko više je davalaca ženskog pola (1319), naspram davalaca muškog pola (706). Na Farmaceutskom fakultetu poslednjih godina povećao se broj studenata farmacije (muškaraca), ali i dalje su dominantno zastupljene studentkinje, tako da je ovaj podatak o većem broju davalaca među ženskom populacijom očekivan.

Pored velike svesti o značaju dobrovoljnog davanja krvi broj davalaca nije na zadovoljavajućem nivou. Promotivne aktivnosti, informisanost i edukacije studenata o značaju dobrovoljnog davanja krvi, imaju kao ishod povećanje motivacije i porast broja studenata davalaca krvi. Godišnja analiza motivacije od ključnog je značaja za poboljšanje regrutovanja i zadržavanje postojećih dobrovoljnih davalaca krvi.

Dušanka Krajnović je ovo istraživanje realizovala u okviru Projekta 14004 finansiranog od Ministarstva prosvete, nauke i tehnološkog razvoja Republike Srbije.

AN OVERVIEW OF THE VOLUNTARY BLOOD DONATION CAMPAIGNS AT THE FACULTY OF PHARMACY IN BELGRADE DURING 2003-2018 PERIOD

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In order to provide sufficient quantities of blood and blood products for everyday needs, a continuous non-remunerated and voluntary engagement of blood donors is necessary. Students are a potential blood donor pool, through the very act of blood donating but also through advocating and campaigning for blood donations at their faculties.

The aims of this paper were to present the historical development of the voluntary blood donation at Belgrade University and analyse the trend in the number of donors at the Faculty of Pharmacy in the period from November 2003 to March 2018.

Data on the total number of voluntary blood donors at the Faculty of Pharmacy were derived from the Blood Transfusion Institute of Serbia records.

„Students blood donors”, an association that played an important role in launching the regular campaigns for voluntary blood donations, was formed in 2003. The voluntary blood donation campaigns were organized at Belgrade University faculties during that year. During the observed 15-year period, of blood donation campaigns at the Faculty of Pharmacy in Belgrade, there were 2134 students eligible to donate blood, out of which 1819 did donate blood. The lowest number of potential donors was recorded in March 2008 (36) and the highest in November 2013 (101).. Female donors (1319) nearly doubled the rate of male donors (706). The number of male students at the Faculty of Pharmacy has increased in recent years, but the majority was female students.

Despite the high awareness of the importance of the voluntary blood donation, the number of donors is not at a satisfactory level. Promotional activities, awareness and education of students on the importance of voluntary blood donation result in a growing motivation and an increase in the number of blood donors amongst the students. The annual analysis of the motivating factors is crucial for improving the recruitment and retention of existing voluntary blood donors.

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