

NAZIV DISERTACIJE: PROCJENA RIZIKA ZA POJAVU LEGIONELOZA U STOMATOLOŠKIM ORDINACIJAMA**Autor:** Amar Žilić**Mentor:** Prof. dr. Zarema Obradović**Datum odbrane:** 24.11.2021.**DOI:** <https://doi.org/10.17532/DD.2021.01>**SAŽETAK**

Legioneloze su bakterijske infekcije, odnosno bolesti koje uzrokuju legionele, a koje mogu varirati od blažeg febrilnog stanja nazvanog Pontiak groznica do brze i potencijalno fatalne upale pluća koja se naziva „legionarska bolest“. Legionella spp. su patogene bakterije koje žive u vodi, a najčešće su izolovane iz vještačkih vodenih sredina, stvorenih od strane čovjeka, kao što su postrojenja za toplu vodu, tuševi, rashladni tornjevi, spa centri, fontane i sistemi vodosnabdijevanja. Poznato je da se legionele mogu naći i u sistemima za vodosnabdijevanje stomatoloških stolica, a neki instrumenti kao što su vodo-vazdušne štrcaljke, turbine i bušilice velike brzine tokom rada stvaraju aerosole koji mogu biti kontaminirani sa Legionella spp. iz sistema vodosnabdijevanja stomatoloških stolica. Ovi aerosoli se mogu raspršiti u usta pacijenata i eventualno udahnuti kao i proširiti u prostoru u kojoj stomatološko osoblje i pacijenti ih mogu inhalirati. U ovom istraživanju su analizirane stomatološke stolice sa dva tipa vodosnabdijevanja: stolice sa direktnim priključkom na gradski – komunalni vodovod i stolice sa rezervoarom – spremnikom za vodu.

Ciljevi ove doktorske disertacije su procijeniti rizik za pojavu legioneloza u stomatološkim ordinacijama u odnosu na način vodosnabdijevanja stomatoloških stolica, utvrditi prisustvo legionela u vodi stomatoloških stolica u odnosu na temperaturu vode, prisutni rezidualni hlor i poštivanje standardnih operativnih procedura vezanih za dezinfekciju i ispuštanje vode, starosti stomatoloških stolica i objekata u kojima su smještene stomatološke ordinacije, te procijeniti rizik za pojavu legioneloza na osnovu prakse provođenja mjera lične zaštite zaposlenih u stomatološkim ordinacijama. Uzorci vode iz sistema vodosnabdijevanja stomatoloških stolica su prikupljeni na području Federacije Bosne i Hercegovine, pri čemu su na terenu mjereni parametri temperature i rezidualnog hlora. Mikrobiološko ispitivanje vode na prisustvo legionela rađeno je u certificiranoj laboratoriji, a metodom anketiranja procjenjivani su rizici za pojavu legioneloza u stomatološkim ordinacijama.

Statističkom analizom koristeći logističku regresiju utvrđeno je da stomatološke stolice sa rezervoarom – spremnikom za vodu imaju 3,2 puta veći rizik za pojavu legioneloza u odnosu na stomatološke stolice direktno prikopčane na gradski/komunalni vodovod. Iako postoje razlike u rasporedu pozitivnih uzoraka u odnosu na temperaturu vode, utvrđeno je da nema statistički značajne razlike u prisustvu Legionella spp. u uzorcima vode stomatoloških stolica sa različitom temperaturom. Rezultati pokazuju statistički značajnu razliku u pojavi Legionella spp. u uzorcima vode iz stomatoloških stolica u odnosu na prisustvo rezidualnog hlora, odnosno rizik za pojavu Legionella spp. je veći u uzorcima vode u kojima nije detektovan rezidualni hlor. Ne postoji statistički značajna razlika u prisustvu Legionella spp. u uzorcima vode uzetim iz sistema koji se ne ispiru i sistema koji se ispiru. Prisustvo Legionella spp. u uzorcima vode iz sistema vodosnabdijevanja koji se ne dezinficiraju je češće za 18,3 puta u odnosu na uzorke vode iz sistema vodosnabdijevanja koji se dezinficiraju. Nema statistički značajne razlike u prisustvu Legionella spp. među stomatološkim stolicama različite starosti. Postoji statistički značajna razlika u prisustvu legionela u objektima različite starosti u kojim su smještene stomatološke ordinacije. U 18,6% stomatoloških ordinacija u kojim je provedeno istraživanje ispitanici se nisu pridržavali mjera lične zaštite prilikom rada u toku anketiranja što ih dovodi u povećani rizik za nastanak legioneloza. U stomatološkim ordinacijama na području Federacije BiH postoji rizik za pojavu legioneloza, odnosno obolijevanja stomatološkog osoblja i njihovih pacijenata te je neophodno definisati zakonski uslovljene preventivne mjere čija će primjena dovesti do smanjenja ovog rizika.

DISSERTATION TITLE:**Author:** Amar Žilić**Mentor:** Prof. dr. Zarema Obradović**Date of defence:** 24: November 2021.**DOI:** <https://doi.org/10.17532/DD.2021.01>**SUMMARY**

Legionellosis are bacterial infections, or diseases caused by legionella, which can range from a mild febrile condition called Pontiac fever to a rapid and potentially fatal pneumonia called "legionnaires' disease." Legionella spp. are pathogenic bacteria that live in water, and are most often isolated from man-made artificial aquatic environments, such as hot water plants, showers, cooling towers, spas, fountains, and water supply systems. Legionella can be found in dental chair water supply systems, and during dental interventions, instruments such as water- air syringes, turbines and high-speed drills create aerosols contaminated with Legionella spp. which can be dispersed into patients' mouth and possibly inhaled or expanded into a room where dental staff and patients can inhale these aerosols. In this study two types of dental chairs were analysed: dental chairs directly connected to the municipal water supply and dental chairs with a water tank.

The objectives of this doctoral dissertation are to assess the risk of legionellosis in dental offices in relation to type of dental chairs water supply, to determine the presence of legionella in the dental chairs water samples in relation to water temperature, residual chlorine, compliance with standard operating procedures related to water disinfection and water system flushing, dental chair age as well as age of buildings where are dental offices situated, and to assess the risk of legionellosis based on the practice of implementing measures of personal protection of employees in dental offices. Water samples were collected from the dental unit waterlines in dental offices in the Federation of Bosnia and Herzegovina. Water temperature and level of residual chlorine were measured on the spot, while taking the samples. Microbiological testing of water samples for the presence of Legionella was conducted in certified laboratory. The risk for legionellosis in dental offices was assessed by answers from survey.

Statistical analysis using logistic regression revealed dental chairs with a water tank have a 3,2 times higher risk of legionellosis compared to dental chairs directly connected to the municipal water supply. Although there are differences in the number of positive samples in relation to water temperature, it was found that there is no statistically significant difference in the presence of Legionella spp. in dental chairs water samples with different temperatures. The results show a statistically significant difference in the occurrence of Legionella spp. in water samples in relation to the level of residual chlorine. The risk for the occurrence of Legionella spp. is higher in water samples where residual chlorine was not detected at all. There is no statistically significant difference in the presence of Legionella spp. in water samples taken from the dental unit waterlines that are regularly flushed and those that are not flushed at all. The presence of Legionella spp. in water samples from non-disinfected dental unit waterlines is 18,3 times more frequent than in water samples from disinfected dental unit waterlines. There is no statistically significant difference in the presence of Legionella spp. among dental chairs of different age. There is a statistically significant difference in the presence of legionella in differently aged buildings in which dental offices are situated. In 18,6% dental practices in which the study was conducted, respondents did not comply to personal protection measures while working, which puts them at increased risk for developing legionellosis. In dental practices in the Federation of BiH, there is a risk of legionellosis for dental staff and their patients, and it is necessary to take legal actions for the necessary preventive measures which application could reduce this risk.