



ANDRIJA STAMPAR
TEACHING INSTITUTE
OF PUBLIC HEALTH

Creating a Healthier Future

REVIEW 2021

SCIENTIFIC ARTICLES IN CURRENT CONTENTS
AND OTHER INDEXED JOURNALS



REVIEW 2021

Scientific articles

in Current Contents and other indexed journals

Andrija Stampar Teaching Institute of Public Health

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FOREWORD

The *2021 Review of Scientific articles in Current Contents and other indexed journals* is an annual report of scientific articles published in *Current Contents* journals and other indexed journals by the employees of the Andrija Stampar Teaching Institute of Public Health. The first chapter brings 17 abstracts of original scientific articles and reviews published in *Current Contents* journals (there were 14 such papers in 2020); three of them are about the COVID-19 pandemic. There are 13 scientific articles published in other indexed journals in the second chapter.

In 2021, there were 53 scientists in the Teaching Institute: 41 with doctoral degrees and 12 with master's degrees. The percentage of female scientists dominates the overall number: 44 female scientists *versus* nine male scientists.

Despite many Institute's active roles during the COVID-19 pandemic, research work was continued. Therefore, we congratulate the employees and their external associates for any scientific contribution.

Institute Head

Sandra Šikić

Review 2021 in digital version is available for download from

<https://stampar.hr/hr/publikacije>



1. ORIGINAL SCIENTIFIC AND REVIEW ARTICLES IN CURRENT CONTENTS

1.1. ASSOCIATION BETWEEN REPORTED MEDICATION ADHERENCE AND HEALTH-RELATED QUALITY OF LIFE IN ADULT PATIENTS WITH HAEMOPHILIA

International Journal of Clinical Pharmacy. 2021;43(6):1500-1507.

DOI:10.1007/s11096-021-01270-x

Impact factor: 2.054

Bago M¹, Butković A², Preložnik Zupan I^{3,4}, Faganel Kotnik B^{3,4}, Prga I¹, Bačić Vrca V^{5,6}, Zupančić Šalek S^{7,8}

¹ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

² Faculty of Humanities and Social Sciences, University of Zagreb, Zagreb, Croatia

³ University Medical Center Ljubljana, Ljubljana, Slovenia

⁴ Faculty of Medicine, University of Ljubljana, Ljubljana, Slovenia

⁵ Clinical Hospital Dubrava, Zagreb, Croatia

⁶ Faculty of Pharmacy and Biochemistry, University of Zagreb, Zagreb, Croatia

⁷ University Hospital Centre Zagreb, Zagreb, Croatia

⁸ Faculty of Medicine, Josip Juraj Strossmayer University of Osijek, Osijek, Croatia

martina.bago@stampar.hr

Abstract

Background: Medication adherence is an important issue, not just health-related, for patients with haemophilia. Poor medication adherence to long-term therapies limits the potential of effective treatments to improve patients' health-related quality of life.

Objective: The aim of this study was to investigate the association of reported medication adherence and health-related quality of life in patients with haemophilia. Data were collected from patients at University Hospital Centre Zagreb, Croatia and at University Medical Centre Ljubljana, Slovenia.

Methods: Adult male patients with severe or moderate haemophilia receiving prophylactic treatment were eligible for the study. Implementation phase of medication adherence was assessed with the self-reported VERITAS-Pro instrument and health-related quality of life with SF-36v2.

Results: A total of 82 participants were included in the study (median age was 44.50, range 18–73 years). The majority of our participants reported being adherent to medication (83%). Participants showed better health in the mental health domains and Mental Component Summary than in the physical health domains and Physical Component Summary. After controlling for demographic, socioeconomic and clinical predictors, better reported medication adherence explained an additional 4–6% of better health variance in Bodily Pain and Social Functioning domains and Mental Component Summary.

Conclusion: We found that reported medication adherence can contribute to better health-related quality of life in patients with haemophilia. Since life with a chronic condition is demanding, it is an important finding that medication adherence to replacement therapy can improve life conditions for patients with haemophilia.

Keywords: haemophilia A, haemophilia B, medication adherence, quality of life

1.2. CATESTATIN AS A BIOMARKER OF CARDIOVASCULAR DISEASES: A CLINICAL PERSPECTIVE

Biomedicines. 2021;9(12):1757. DOI:10.3390/biomedicines9121757

Impact factor: 6.081

Bozić J¹, Kumrić M¹, Tičinović Kurir T^{1,2}, Urlić H³, Martinović D¹, Vilović M¹, Tomasović Mrčela N^{4,5}, Borovac JA^{2,5}

¹ School of Medicine, University of Split, Split, Croatia

² University Hospital of Split, Split, Croatia

³ Clinic Magdalena, Krapinske Toplice, Croatia

⁴ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

⁵ University of Split, Split, Croatia

josko.bozic@mefst.hr

Abstract

Accounting for almost one-third of the global mortality, cardiovascular diseases (CVDs) represent a major global health issue. Emerging data suggest that most of the well-established mechanistic explanations regarding the cardiovascular pathophysiology are flawed, and cannot fully explain the progression and long-term effects of these diseases. On the other hand, dysregulation of the sympathetic nervous system (SNS) has emerged as an important player in the pathophysiology of CVDs. Even though upregulated SNS activity is an essential compensatory response to various stress conditions, in the long term, it becomes a major contributor to both cardiac dysfunction and vascular damage. Despite the fact that the importance of SNS hyperactivity in the setting of CVDs has been well-appreciated, its exact quantification and clinical application in either diagnostics or therapy of CVDs is still out of reach. Nevertheless, in recent years a number of novel laboratory biomarkers implicated in the pathophysiology of

SNS activation have been explored. Specifically, in this review, we aimed to discuss the role of catestatin, a potent physiological inhibitor of catecholamine spillover that offers cardioprotective effects. Limited data indicate that catestatin could also be a reliable indirect marker of SNS activity and it is likely that high CST levels reflect advanced CV disease burden. Consequently, large-scale studies are required to validate these observations in the upcoming future.

Keywords: catestatin, chromogranin A, biomarker, cardiovascular disease, heart failure, sympathetic nervous system, catecholamine

1.3. CHEMICAL CHARACTERISTICS OF CROATIAN TRADITIONAL *ISTARSKI PRŠUT* (PDO) PRODUCED FROM TWO DIFFERENT PIG GENOTYPES

Molecules. 2021;26(14):4140. Epub 7 July 2021

Impact Factor: 4.412

Krvavica M¹, Lasić D², Gajdoš Kljusurić J³, Đugum J⁴, Janović Š⁵, Milovac S², Bošnjir J²

¹ Marko Marulic Polytechnic in Knin, Knin, Croatia

² Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

³ Faculty of Food Technology and Biotechnology, University of Zagreb, Zagreb, Croatia

⁴ Ministry of Agriculture, Zagreb, Croatia

⁵ University North, Koprivnica, Croatia

jasenka.gajdos@pbf.hr

Abstract

Chemical characteristics of raw and processed *Istarski pršut* (PDO) produced from two different pig genotypes were studied with special emphasis on amino and fatty acid composition and factors of lipid stability. Raw hams of Large White (LW)xLandrace (L), and (LWxL)xDuroc (D) pig genotypes were used in the study (20 hams of each genotype). All left raw hams from each carcass were processed in accordance with the PDO specification of *Istarski pršut*, and other half (the right ones) of (LWxL)xD genotype were used for analyses of raw hams (fresh muscles). *Istarski pršut* was evaluated on the basis of the chemical parameters of the raw and matured lean ham. The process of dry curing significantly influenced the chemical properties of *Istarski pršut*. Despite the higher content of intramuscular fat and polyunsaturated fatty acids, the fat of (LWxL)xD ham was much more resistant to hydrolysis and oxidation, suggesting that fatty acid profile

and other factors, also play a significant role. Significant differences between pig genotypes in the amino acid and fatty acid profiles were found. The analyzed *Istarski pršut* may be distinguished by prints of multivariate chemometric statistical analysis, based on their amino acid and fatty acid compositions.

Keywords: *Istarski pršut*, Duroc, dry-cured ham, amino acids, fatty acids, lipid oxidation

1.4. DESIGN AND EVALUATION OF AN HACCP GLUTEN-FREE PROTOCOL IN A CHILDREN'S HOSPITAL

Food control. 2021;120:107527. DOI:10.1016/j.foodcont.2020.107527

Impact Factor: 5.548

Vukman D¹, Vilićnik P¹, Vahčić N², Lasić D³, Niseteo T¹, Panjkota Krbavčić I², Marković K², Bituh M²

¹ Children's Hospital Zagreb, Zagreb, Croatia

² Faculty of Food Technology and Biotechnology, University of Zagreb, Zagreb, Croatia

³ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

petra.vilicnik@kdb.hr

Abstract

For patients with gluten intolerance, the most common cause of treatment failure is an inadequate gluten-free diet (GFD), such as because of gluten contamination. Here we describe the design, implementation and validation of an HACCP protocol for preparing gluten-free meals in a children's hospital. Gluten content in prepared meals was analyzed using R5 sandwich ELISA, which indicated that gluten concentrations did not exceed 20 mg/kg. Total daily gluten intake of patients on the GFD was less than 10 mg.

Keywords: hospital kitchen, HACCP protocol, implementation, gluten, gluten-free diet

1.5. EMERGING TRENDS IN THE WEST NILE VIRUS EPIDEMIOLOGY IN CROATIA IN THE “ONE HEALTH” CONTEXT, 2011-2020

Tropical Medicine and Infectious Disease. 2021;6(3):140.

DOI:10.3390/tropicalmed6030140

Vilibić Čavlek T^{1,2}, Savić V³, Klobučar A⁴, Thomas F⁵, Ilić M¹, Bogdanić M¹, Tabain I¹, Stevanović V⁶, Santini M⁷, Curman Posavec M⁴, Petrinić S⁴, Benvin I⁶, Ferencak I¹, Rozac V⁸, Barbić Lj⁶

¹ Croatian Institute of Public Health, Zagreb, Croatia

² School of Medicine, University of Zagreb, Zagreb, Croatia

³ Croatian Veterinary Institute, Zagreb, Croatia

⁴ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

⁵ Merkur University Hospital, Zagreb, Croatia

⁶ Faculty of Veterinary Medicine, University of Zagreb, Zagreb, Croatia

⁷ University Hospital for Infectious Diseases “Dr Fran Mihaljevic”, Zagreb, Croatia

⁸ Public Institution Nature Park Kopacki Rit, Kopacevo, Croatia

tatjana.vilibic-cavlek@hzjz.hr

Abstract

West Nile virus (WNV) is one of the most widely distributed (re-)emerging arboviruses. In Croatia, acute WNV infections as well as seropositivity were detected in humans, horses, birds and poultry. Although serologic evidence of WNV human infections dates back to the 1970s, no clinical cases were reported until 2012. WNV outbreaks, as well as sporadic infections, were continuously recorded in continental Croatian counties from 2012 to 2018. In addition, acute asymptomatic infections (IgM antibodies) in horses have been regularly notified in continental regions since 2012, while seropositive horses (seroprevalence rates 3.7-21.4%) were detected in both continental and coastal regions.

Moreover, WNV seropositivity in poultry (1.8-22.9%) was reported from 2013 to 2020. During the largest WNV outbreak in 2018, WNV RNA was detected for the first time in two dead goshawks (*Accipiter gentilis*) from the same aviary in North-West Croatia, while WNV antibodies were found in one buzzard (*Buteo buteo*) from the same region. In addition, WNV RNA was detected in a dead blackbird (*Turdus merula*) at the Croatian littoral. The phylogenetic analysis of 11 strains detected in urine samples of patients with neuroinvasive disease and 1 strain detected in a goshawk showed circulation of WNV lineage 2. Thus far, WNV has not been detected in mosquitoes in Croatia.

Keywords: West Nile virus, epidemiology, “One Health”, Croatia

1.6. HEALTH-RELATED QUALITY OF LIFE IN PATIENTS WITH HAEMOPHILIA AND ITS ASSOCIATION WITH DEPRESSIVE SYMPTOMS – A STUDY IN CROATIA AND SLOVENIA

Psychiatria Danubina. 2021;33(3):334-341. DOI:10.24869/psyd.2021.334

Impact Factor: 1.063

Bago M¹, Butković A², Faganel Kotnik B^{3,4}, Prga I¹, Bačić Vrca V^{5,6}, Zupančić Šalek S^{7,8}, Preložnik Zupan I^{3,4}

¹ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

² Faculty of Humanities and Social Sciences, University of Zagreb, Zagreb, Croatia

³ University Medical Centre Ljubljana, Ljubljana, Slovenia

⁴ Faculty of Medicine, University of Ljubljana, Ljubljana, Slovenia

⁵ Clinical Hospital Dubrava, Zagreb, Croatia

⁶ Faculty of Pharmacy and Biochemistry, University of Zagreb, Zagreb, Croatia

⁷ University Hospital Centre Zagreb, Zagreb, Croatia

⁸ Faculty of Medicine, University of Zagreb, Zagreb, Croatia

martina.bago@stampar.hr

Abstract

Background: There are only a few studies in patients with haemophilia (PWH) that examined both quality of life and depressive symptoms, with only few studies examining their association. Aim of this study was to examine the association between depressive symptoms and health-related quality of life (HRQoL) in PWH from Croatia and Slovenia.

Subjects and methods: A total of 112 adult PWH on prophylactic (73%) or on-demand (27%) treatment were included in the study (median age 46 years, range 18-73 years). Depressive symptoms were assessed with BDI-II, HRQoL with SF-

36v2, demographic and socioeconomic data were collected using a questionnaire, and clinical data were obtained from medical records.

Results: All HRQoL scores were significantly negatively correlated with BDI-II in the -0.42 to -0.70 range (all $p < 0.05$). Sociodemographic and clinical variables explained 28-51% of HRQoL variance scores. Depressive symptoms explained additional variance for six HRQoL domain scores, with incremental variance being larger for mental domain scores (ranging between 10-27%), and for Mental Component Summary score (26%).

Conclusions: This study's findings support that having depressive symptoms is associated with HRQoL of PWH, more so in the mental health than in the physical health domains.

Keywords: depression, haemophilia A, haemophilia B, quality of life

1.7. HIGHER AIRBORNE POLLEN CONCENTRATIONS CORRELATED WITH INCREASED SARS-CoV-2 INFECTION RATES, AS EVIDENCED FROM 31 COUNTRIES ACROSS THE GLOBE

Proceedings of the National Academy of Sciences of the United States of America. 2021;118(12):e2019034118. Epub 8 March 2021

Impact Factor: 11.205

Damialis A^{1,2,3}, Gilles S⁴, Sofiev M⁴, Sofieva V⁴, Kolek F^{1,2,3}, Bayr D^{1,2,3}, Plaza MP^{1,2,3}, Leier Wirtz V^{1,2,3}, Kaschuba S^{1,2,3}, Ziska LH⁵, COVID-19/POLLEN study group (Stjepanović B⁶, Večenaj A⁶ et al)

¹ Technical University of Munich, Munich, Germany

² Institute of Environmental Medicine, Helmholtz Centre Munich, Augsburg, Germany

³ Faculty of Medicine, University of Augsburg, Augsburg, Germany

⁴ Finnish Meteorological Institute, Helsinki, Finland

⁵ Mailman School of Public Health, Columbia University, New York, United States of America

⁶ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

thanos.damialis@tum.de

Abstract

Pollen exposure weakens the immunity against certain seasonal respiratory viruses by diminishing the antiviral interferon response. Here we investigate whether the same applies to the pandemic severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which is sensitive to antiviral interferons, if infection waves coincide with high airborne pollen concentrations. Our original hypothesis was that more airborne pollen would lead to increases in infection rates. To examine this, we performed a cross-sectional and longitudinal data analysis on

SARS-CoV-2 infection, airborne pollen, and meteorological factors. Our dataset is the most comprehensive, largest possible worldwide from 130 stations, across 31 countries and five continents. To explicitly investigate the effects of social contact, we additionally considered population density of each study area, as well as lockdown effects, in all possible combinations: without any lockdown, with mixed lockdown–no lockdown regime, and under complete lockdown. We found that airborne pollen, sometimes in synergy with humidity and temperature, explained, on average, 44% of the infection rate variability. Infection rates increased after higher pollen concentrations most frequently during the four previous days. Without lockdown, an increase of pollen abundance by 100 pollen/m³ resulted in a 4% average increase of infection rates. Lockdown halved infection rates under similar pollen concentrations. As there can be no preventive measures against airborne pollen exposure, we suggest wide dissemination of pollen–virus coexposure dire effect information to encourage high-risk individuals to wear particle filter masks during high springtime pollen concentrations.

Keywords: COVID-19, pollen, viral infection, aerobiology

1.8. *KLEBSIELLA PNEUMONIAE* CARBAPENEMASE (KPC) IN URINARY INFECTION ISOLATES

Archives of Microbiology. 2021;203:1825-1831.

DOI:10.1007/s00203-020-02161-x

Impact Factor: 2.552

Bedenić B^{1,2}, Sardelić S³, Bogdanić M⁴, Zarfel G⁵, Beader N^{1,2}, Šuto S⁶, Krilanović M⁷, Vraneš J^{1,6}

¹ School of Medicine, University of Zagreb, Zagreb, Croatia

² University Hospital Center Zagreb, Zagreb, Croatia

³ University Hospital Center Split, Split, Croatia

⁴ National Public Health Institute, Zagreb, Croatia

⁵ Institute for Hygiene, Microbiology and Environmental Medicine, Medical University of Graz, Graz, Austria

⁶ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

⁷ Public Health Institute of Dubrovnik-Neretva County, Dubrovnik, Croatia

branka.bedenic@kbc-zagreb.hr

Abstract

Recently, emergence of carbapenem-resistance, in particular due to *Klebsiella pneumoniae* carbapenemase (KPC), was observed among *K. pneumoniae* causing urinary tract infections in Croatia. The aim of the study was to characterize, antimicrobial susceptibility, carbapenem resistance, virulence traits and plasmid types of the urinary KPC positive isolates of *K. pneumoniae*. The antimicrobial susceptibility to a wide range of antibiotics was determined by broth microdilution method. The transferability of meropenem resistance was determined by conjugation (broth mating method) employing *Escherichia coli* J63

strain resistant to sodium azide. Genes encoding broad and extended-spectrum β -lactamases, plasmid-mediated AmpC β -lactamases, group A and B carbapenemases, and carbapenem hydrolyzing oxacillinases ($bla_{OXA-48like}$), respectively, were determined by Polymerase chain reaction (PCR). In total 30 KPC-positive *K. pneumoniae* urinary isolates collected from different regions of Croatia were analysed. The isolates were uniformly resistant to all tested antibiotics except for variable susceptibility to gentamicin, sulphamethoxazole/trimethoprim, and colistin, respectively. Four isolates were resistant to colistin with MICs values ranging from 4 to 16 mg/L. All tested isolates were susceptible to ceftazidime/avibactam. Sixteen isolates transferred meropenem resistance to *E. coli* recipient strain by conjugation. Other resistance markers were not co-transferred. PCR was positive for bla_{KPC} and bla_{SHV} genes in all isolates whereas 13 isolates tested positive also for bla_{TEM} genes. PCR based replicon typing (PBRT) revealed the presence of FII in 13 and FIA plasmid in two strains. The study showed dissemination of KPC-producing *K. pneumoniae* in urinary isolates, posing a new epidemiological and treatment challenge. Sulphamethoxazole/trimethoprim, colistin, and ceftazidime/avibactam remain so far, as the therapeutic options.

Keywords: *Klebsiella pneumoniae*, KPC, urinary tract infections, resistance

1.9. NOVEL PRESERVATION METHODS FOR INORGANIC ARSENIC SPECIATION IN MODEL AND NATURAL WATER SAMPLES BY STRIPPING VOLTAMMETRIC METHOD

Applied Sciences. 2021;11(19):8811. DOI:10.3390/app11198811

Impact Factor: 2.679

Alispahić A¹, Krivohlavek A², Galić N³

¹ Faculty of Pharmacy, University of Sarajevo, Sarajevo, Bosnia and Herzegovina

² Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

³ Faculty of Science, University of Zagreb, Zagreb, Croatia

ngalic@chem.pmf.hr

Abstract

In this study, the preservation of As(III) in model solutions and natural groundwater samples from four locations in Croatia was conducted. Model laboratory samples were spiked with As(III) and As(V), and different complexing agents. Solutions were analysed in intervals of 24, 48 h and during ten days after preparation. Model samples containing citric acid, sodium citrate, sodium oxalate and potassium sodium tartrate in combination with acetic acid, spiked with As(III) and As(V), showed good species preservation. As(III), in model samples, was preserved for 7 days with citric acid, and citric acid in combination with acetic acid, as well as with tartrate. As(III), in natural samples, was preserved for 6 to 12 days with potassium sodium tartrate, citric acid, and citric acid in combination with acetic acid and showed improvement, compared with unpreserved samples (oxidation in 3 days). The results showed that acetic acid alone was not successful in preserving As speciation. Good resolution of inorganic arsenic species was achieved using differential pulse anodic stripping voltammetry technique (DPASV). Since this technique is comparatively cheaper and more convenient to

use than other available techniques it could become a method of choice for arsenic speciation in water.

Keywords: inorganic arsenic species, preservation, sample stability, anodic stripping voltammetry

1.10. PREVALENCE AND CORRELATES OF MUSCLE-STRENGTHENING ACTIVITY PARTICIPATION IN CROATIA: A CROSS-SECTIONAL STUDY IN A NATIONAL REPRESENTATIVE SAMPLE OF 4561 ADULTS

International Journal of Environmental Research and Public Health.

2021;18(17):8905. DOI:10.3390/ijerph18178905

Impact factor: 3.390

Radašević H¹, Čvrljak J¹, Pedišić Ž², Jurakić D³

¹ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

² Institute for Health and Sport, Victoria University, Melbourne, Australia

³ Faculty of Kinesiology, University of Zagreb, Zagreb, Croatia

hrvoje.radasevic@stampar.hr

Abstract

The World Health Organization recommends adults to engage in muscle-strengthening activity (MSA) at least two times per week. The aim of this study was to determine the prevalence and correlates of MSA in Croatian adults. We analysed self-reported data collected among 4561 Croatians aged ≥ 18 years within the European Health Interview Survey (EHIS wave 2). We calculated the weighted prevalence of meeting the MSA guidelines, and odds ratios for different population groups, adjusted for a range of sociodemographic and lifestyle variables in a multivariable logistic regression analysis. The prevalence of meeting the MSA guidelines was 8.0% (95% CI: 7.2, 8.8) in the overall sample, 5.4% (95% CI: 4.5, 6.4) among females, and 10.9% (95% CI: 9.6, 12.3) among males. We found significantly lower odds of meeting the MSA guidelines for females, older age groups, inhabitants of sparsely populated areas, those with a low education level, obese individuals, and those who did not rate their health as “very good” ($p < 0.05$ for all). The vast majority of Croatian adults do not meet the MSA guidelines. Public health initiatives to promote MSA in Croatia should focus on

females, seniors, sparsely populated areas, people with low education, obese individuals, and those with impaired health.

Keywords: exercise, motor activity, physical inactivity, resistance training, surveillance

1.11. PREVALENCE AND RISK FACTORS FOR LYMPHOCYTIC CHORIOMENINGITIS VIRUS INFECTION IN CONTINENTAL CROATIAN REGIONS

Tropical Medicine and Infectious Disease. 2021;6(2):67.

DOI:10.3390/tropicalmed6020067

Vilibić Čavlek T^{1,2}, Oreški T³, Korva M⁴, Kolarić B^{5,6}, Stevanović V⁷, Židovec Lepej S⁸, Tabain I¹, Jeličić P¹, Miklaušić Pavić B⁸, Savić V⁹, Barbić Lj⁷, Avšič Županc T⁴

¹ Croatian Institute of Public Health, Zagreb, Croatia

² School of Medicine, University of Zagreb, Zagreb, Croatia

³ Gensynthese, Eurofins Genomics, Ebersberg, Germany

⁴ Faculty of Medicine, University of Ljubljana, Ljubljana, Slovenia

⁵ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

⁶ Medical Faculty, University of Rijeka, Croatia

⁷ Faculty of Veterinary Medicine, University of Zagreb, Zagreb, Croatia

⁸ University Hospital for Infectious Diseases “Dr Fran Mihaljević”, Zagreb, Croatia

⁹ Croatian Veterinary Institute, Zagreb, Croatia

szidovec@gmail.com

Abstract

Lymphocytic choriomeningitis virus (LCMV) is a neglected human pathogen associated with aseptic meningitis, severe systemic infections in immunocompromised persons, and congenital anomalies. Data on the prevalence of LCMV infections are scarce. We analyzed the seroprevalence of LCMV in continental Croatian regions. A total of 338 serum samples of professionally exposed (forestry workers, hunters, agriculture workers in contact with rodents) and non-exposed populations (general population, pregnant women) were tested for the presence of LCMV antibodies using indirect

immunofluorescence assay. No participants reported recent febrile disease. LCMV IgG antibodies were detected in 23/6.8% of participants: 9.8% exposed persons and 5.1% non-exposed persons (6.1% in the general population and 3.9% in pregnant women). No participants were LCMV IgM positive. Although higher seropositivity was found in males compared to females (8.9% vs. 4.7%), inhabitants of suburban/rural areas compared to inhabitants of urban areas (9.2% vs. 4.6%), and persons who used well as a source of water compared to those who used tap (11.4% vs. 5.6%), these differences did not reach statistical significance. Results of logistic regression showed that the presence of rodents in the house/yard and cleaning rodent nests were associated with an elevated risk for LCMV infection (OR = 2.962, 95% CI = 1.019–8.607).

Keywords: lymphocytic choriomeningitis virus, seroprevalence, general population, professionally exposed, pregnant women, Croatia

1.12. PRODUCING DIRECT FOOD PACKAGING USING DEINKED OFFICE PAPER GRADES – DEINKABILITY AND FOOD CONTACT SUITABILITY EVALUATION

Sustainability. 2021;13(22):12550. DOI:10.3390/su132212550

Impact factor: 3.251

Jamnicki Hanzer S¹, Lozo B¹, Barušić L²

¹ Faculty of Graphic Arts, University of Zagreb, Zagreb, Croatia

² Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

lidija.barusic@stampar.hr

Abstract

Paper recycling is the most eco-efficient waste management option, since the use of recycled fibers reduces the need for virgin wood fiber and lowers energy consumption, and hence has a positive effect on the environment. The use of recycled paper is by far the highest in the packaging industry. In food packaging production, recycled paper is often favored over paper and board made from virgin fibers. However, due to the possible hazardous chemicals that can be found in recycled paper, there is a dilemma of how to overcome food safety issues while making food packaging more circular. The objective of the study was to determine if deinked office paper grades could be used as an alternative fiber source in the production of food packaging white top linerboards. For that purpose, three different types of digitally printed papers were submitted to a chemical deinking flotation in laboratory conditions, and the handsheets formed after each recycling trial were tested on the suitability for direct food contact. Evaluation of deinkability for each group of recycled prints was performed, as well. Deinkability was evaluated by calculating the flotation yield, pulp's brightness and whiteness increase, ink elimination factor, determination of residual ink area, as well as ash content elimination. Food safety evaluation was performed by determining the content of heavy metals (Cd, Pb, Hg, and Cr VI), primary aromatic amines, diisopropylnaphthalenes (DIPN), phthalates, and

polychlorinated biphenyls (PCB) from aqueous or organic solvent extracts of recycled paper pulp. The fastness of the fluorescent whitening agents was determined, as well. Of all evaluated deinking flotation efficiency parameters, only flotation yield and ash reduction by flotation were positively assessed. High content of residual ink particles detected after the flotation stage indicates that the flotation was not a successful method for the elimination of disintegrated ink particles, which was also confirmed by deficient results of ink elimination measurements and whiteness increase. Flotation proved to be the least efficient in the recycling of inkjet prints, where the lowest ink elimination, whiteness, and brightness values were achieved. As far as food safety assessment of deinked pulp is concerned, all tested deinked handsheets were found suitable to be used in direct contact with foods.

Keywords: office paper grades, deinking by flotation, white top linerboard, food packaging, food contact analysis

1.13. SCREENING OF MOSQUITOES FOR WEST NILE VIRUS AND USUTU VIRUS IN CROATIA, 2015-2020

Tropical Medicine and Infectious Disease, 2021;6(2):45

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Klobučar A¹, Savić V¹, Curman Posavec M¹, Petrinić S¹; Kuhar U³; Toplak I³; Madić J⁴; Vilibić Čavlek T^{5,6}

¹ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

² Croatian Veterinary Institute, Zagreb, Croatia

³ Veterinary Faculty, University of Ljubljana, Ljubljana, Slovenia

⁴ Faculty of Veterinary Medicine, University of Zagreb, Zagreb, Croatia

⁵ Croatian Institute of Public Health, Zagreb, Croatia

⁶ School of Medicine, University of Zagreb, Zagreb, Croatia

ana.klobucar@stampar.hr

Abstract

In the period from 2015 to 2020, an entomological survey for the presence of West Nile virus (WNV) and Usutu virus (USUV) in mosquitoes was performed in northwestern Croatia. A total of 20,363 mosquitoes were sampled in the City of Zagreb and Medimurje county, grouped in 899 pools and tested by real-time RT-PCR for WNV and USUV RNA. All pools were negative for WNV while one pool each from 2016 (*Aedes albopictus*), 2017 (*Culex pipiens* complex), 2018 (*Cx. pipiens* complex), and 2019 (*Cx. pipiens* complex), respectively, was positive for USUV. The 2018 and 2019 positive pools shared 99.31% nucleotide homology within the USUV NS5 gene and both clustered within USUV Europe 2 lineage. The next-generation sequencing of one mosquito pool (*Cx. pipiens* complex) collected in 2018 in Zagreb confirmed the presence of USUV and revealed several dsDNA and ssRNA viruses of insect, bacterial and mammalian origin.

Keywords: Usutu virus, West Nile virus, mosquitoes, Croatia

1.14. SEASONAL CORONAVIRUSES AND OTHER NEGLECTED RESPIRATORY VIRUSES: A GLOBAL PERSPECTIVE AND A LOCAL SNAPSHOT

Frontiers in Public Health. 2021;9. DOI:10.3389/fpubh.2021.691163

Impact factor: 3.709

Ljubin Sternak S^{1,2}, Meštrović T^{3,4}, Lukšić I¹, Mijač M^{1,2}, Vraneš J^{1,2}

¹ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

² School of Medicine, University of Zagreb, Zagreb, Croatia

³ Zora Profozić Polyclinic, Zagreb, Croatia

⁴ University Centre Varaždin, University North, Varaždin, Croatia

Abstract

Respiratory viral infections are the leading cause of morbidity and mortality in the world; however, there are several groups of viruses that are insufficiently routinely sought for, and can thus be considered neglected from a diagnostic and clinical standpoint. Timely detection of seasonality of certain respiratory viruses (e.g., enveloped viruses such as seasonal coronaviruses) in the local context can aid substantially in targeted and cost-effective utilization of viral diagnostic approaches. For the other, non-enveloped and year-round viruses (i.e., rhinovirus, adenovirus, and bocavirus), a continuous virological diagnosis needs to be implemented in clinical laboratories to more effectively address the aetiology of respiratory infections, and assess the overall impact of these viruses on disease burden. While the coronavirus disease 2019 (COVID-19) pandemic is still actively unfolding, we aimed to emphasize the persistent role of seasonal coronaviruses, rhinoviruses, adenoviruses and bocaviruses in the aetiology of respiratory infections. Consequently, this paper concentrates on the burden and epidemiological trends of aforementioned viral groups on a global level, but also provides a snapshot of their prevalence patterns in Croatia in order to underscore the potential implications of viral seasonality. An overall global prevalence in

respiratory tract infections was found to be between 0.5 and 18.4% for seasonal coronaviruses, between 13 and 59% for rhinoviruses, between 1 and 36% for human adenoviruses, and between 1 and 56.8% for human bocaviruses. A Croatian dataset on patients with respiratory tract infection and younger than 18 years of age has revealed a fairly high prevalence of rhinoviruses (33.4%), with much lower prevalence of adenoviruses (15.6%), seasonal coronaviruses (7.1%), and bocaviruses (5.3%). These insights represent a relevant discussion point in the context of the COVID-19 pandemic where the testing of non-SARS-CoV-2 viruses has been limited in many settings, making the monitoring of disease burden associated with other respiratory viruses rather difficult.

Keywords: respiratory tract infections, seasonal coronavirus, rhinovirus, adenovirus, bocavirus, Croatia

1.15. THE EFFECT OF STANDARD-DOSE WINTERTIME VITAMIN D SUPPLEMENTATION ON INFLUENZA INFECTION IN IMMUNIZED NURSING HOME ELDERLY RESIDENTS

Croatian Medical Journal. 2021;62(5):495-503. DOI:10.3325/cmj.2021.62.495

Impact Factor: 1.351

Godan Hauptman A¹, Lukić Grlić A^{2,3}, Vraneš J^{3,4}, Milošević M³, Gagro A^{2,3,5}

¹ University Hospital Center Zagreb, Zagreb, Croatia

² Children's Hospital Zagreb, Zagreb, Croatia

³ School of Medicine, University of Zagreb, Zagreb, Croatia

⁴ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

⁵ Faculty of Medicine, Josip Juraj Strossmayer University, Osijek, Croatia

amarela.lukic@kdb.hr

Abstract

Aim: To investigate whether three-month oral vitamin D supplementation (800 IU in drops) reduces the risk of influenza infection in elderly nursing home residents vaccinated against influenza.

Methods: This cross-sectional observational study enrolled 97 participants (73.2% women) who received one dose of seasonal trivalent 2016-2017 influenza vaccine. The patients were randomized into an experimental group, which received vitamin D supplementation for three months starting on the day of vaccination, and a control group, which did not receive vitamin D supplementation. The primary outcome was the number of influenza infections laboratory-confirmed using a rapid point-of-care test based on nasal swabs collected during vitamin D supplementation. The secondary outcome was serum 25-hydroxyvitamin D level at the end of the study.

Results: The mean age \pm standard deviation was 78.5 ± 8.8 years. All participants had vitamin D deficiency at baseline. Twenty-three participants who developed signs of respiratory infections during the study were tested for influenza virus. Although the number of influenza-positive participants was lower in the group receiving vitamin D supplementation as compared with the control group (5 vs 12), this difference was not significant. Vitamin D supplementation failed to increase 25(OH)D levels after three months of supplementation.

Conclusion: Elderly nursing home residents in Zagreb County have a significant vitamin D deficiency. The recommended national supplementation of 800 IU daily failed to lead to vitamin D sufficiency and did not reduce the risk of influenza infection among the vaccinated elderly.

1.16. UNAUTHORIZED FOOD MANIPULATION AS A CRIMINAL OFFENSE: FOOD AUTHENTICITY, LEGAL FRAMEWORKS, ANALYTICAL TOOLS AND CASES

Foods. 2021;10(11):2570. DOI:10.3390/foods10112570

Impact Factor: 4.35

Jurica K¹, Brčić Karačonji I^{2,3}, Lasić D⁴, Bursać Kovačević D⁵, Putnik P⁶

¹ Ministry of the Interior, Zagreb, Croatia

² Institute for Medical Research and Occupational Health, Zagreb, Croatia

³ Faculty of Health Studies, University of Rijeka, Rijeka, Croatia

⁴ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

⁵ Faculty of Food Technology and Biotechnology, University of Zagreb, Zagreb, Croatia

⁶ Department of Food Technology, University North, Koprivnica, Croatia

pputnik@alumni.uconn.edu

Abstract

Food fraud is a criminal intent motivated by economic gain to adulterate or misrepresent food ingredients and packaging. The development of a reliable food supply system is at great risk under globalization, but Food Business Operators (FBOs) have a legal obligation to implement and maintain food traceability and quality at all stages of food production, processing, and distribution. Incidents of food fraud have a strong negative impact on consumer confidence in the food industry. Therefore, local and international regulatory mechanisms are established to prevent or mitigate food fraud. This review brings new perspectives linking EU and US legislation, as well as new definitions and descriptions of the criminal aspect of food fraud incidents. It also describes certain new insights into the application of state-of-the-art methods and

techniques that provide valuable tools for geographic, botanical, or other chemical markers of food authenticity. The review also provides an overview of the most common cases of food fraud worldwide from 2010 to 2020. Further research is needed to support the development of predictive models for innovative approaches to adulteration, especially when some valuable nutrients are replaced by toxic ingredients. A possible solution to minimize food fraud incidents is to increase the level of risk-based inspections, establish more productive monitoring and implementation of food protection systems in the supply chain, and implement better ingredient control and certification. National and international (e.g., regional) police offices for food fraud should be introduced, possessing knowledge and skills in food, food safety, food processing, and food products, as initial positive results have emerged in some countries.

Keywords: food authenticity, criminal offense, unauthorized food manipulation, food defence, mitigation strategy

1.17. WANING IMMUNITY SIX MONTHS AFTER BIONTECH/PFIZER COVID-19 VACCINATION AMONG NURSING HOME RESIDENTS IN ZAGREB, CROATIA

Croatian Medical Journal. 2021;62(6):630-633. DOI:10.3325/cmj.2021.62

Impact Factor: 1.351

Kolaric B^{1,2}, Ambriovic Ristov A³, Tabain I⁴, Vilibic Cavlek T^{4,5}

¹ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

² Faculty of Medicine, University of Rijeka, Rijeka, Croatia

³ Ruđer Bošković Institute, Zagreb, Croatia

⁴ Croatian Institute of Public Health, Zagreb, Croatia

⁵ School of Medicine, Zagreb, Croatia

branko.kolaric@stampar.hr

Abstract

Aim: To assess the humoral immunity to COVID-19 in nursing home residents six months after vaccination.

Methods: This seroepidemiological research enrolled 118 residents of one nursing home in Zagreb. All participants received two doses of BioNTech/Pfizer COVID-19 and had no previously detected SARS-CoV-2 infection. The samples were tested for the presence of neutralizing antibodies using a virus neutralization test. A SARS-CoV-2 strain isolated in Vero E6 cells from a Croatian COVID-19 patient was used as a stock virus. Neutralizing antibody titer was defined as the reciprocal of the highest serum dilution that showed at least 50% neutralization. Neutralizing antibody titer ≥ 8 was considered positive.

Results: Sixty-four (54%) participants had a positive neutralizing antibody titer, 27 (23%) had a low positive titer (titer 8), and 27 (23%) had a negative titer. Women had a significantly higher median titer than men (16 [interquartile range, IQR 24] vs 8 [IQR 12], Mann-Whitney U = 1033, $P = 0.003$). Age was negatively

but not significantly correlated with neutralizing antibody titer (Spearman's rho - 0.132, $P = 0.155$).

Conclusion: Almost half of the participants (46%) had a negative or low positive titer six months after having been fully vaccinated. This study suggests that humoral immunity among nursing home residents considerably wanes six months after BioNTech/Pfizer COVID-19 vaccination. Our results could contribute to the discussion about the need for a booster dose.

2. ORIGINAL SCIENTIFIC AND REVIEW ARTICLES IN OTHER INDEXED JOURNALS

6.1. ASSESSMENT OF INTRACELLULAR ACCUMULATION OF CADMIUM AND THALLIUM

Journal of Pharmacological and Toxicological Methods. 2021;110:107087. Epub 19 June 2021

Impact Factor: 2.252

Krivohlavek A¹, Kuharić Ž¹, Marjanović Čermak AM², Šikić S¹, Pavičić I², Domijan AM³

¹ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

² Institute for Medical Research and Occupational Health, Zagreb, Croatia

³ Faculty of Pharmacy and Biochemistry, University of Zagreb, Zagreb, Croatia

adomijan@pharma.hr

Abstract

The aim of the study was to develop fast and accurate method for assessment of intracellular level of cadmium (Cd) and thallium (Tl), and to establish accumulation of the metals in the cells. HepG2 cells were treated with Cd or Tl (1.0 or 10.0 mg/L; 24 h) and level of Cd or Tl was assessed. ICP-MS was applied, and the method was optimized and validated. Correlation coefficient (R^2) for Cd was 0.9999 with intercept 0.0732 while for Tl was 1.00009 with intercept -0.1497, and limit of detection (LOD) for Cd was 0.020 $\mu\text{g/L}$ and for Tl 0.097 $\mu\text{g/L}$. Both metals, Cd and Tl, accumulate in the cells in concentration-dependent manner. However, higher uptake of Cd in comparison to Tl was observed. Cells treated with the same concentration of the metal (1.0 mg/L) accumulated 10.0% of Cd and 1.0% of Tl. Higher uptake of Cd than Tl can explain higher toxicity of Cd toward HepG2 cells. Obtained results imply to the importance of monitoring the level of metals in the cells in order to connect changes at the molecular level with exposure to specific metal.

Keywords: CP-MS, sample preparation, cell uptake, toxicity

6.2. BIOINDICATOR DETECTION OF PESTICIDE RESIDUES IN THE ENVIRONMENT USING HONEY BEES

Journal of Environmental Protection and Ecology. 2021;22(2):458-466

Impact Factor: 0.577

Jurak G¹, Bošnjir J¹, Racz A², Brkić D¹, Prskalo I¹, Kiš D³, Ozimec S³, Kalambura S⁴

¹ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

² University of applied health sciences, Zagreb, Croatia

³ Faculty of Agrobiotechnical Sciences Osijek, Josip Juraj Strossmayer University of Osijek, Osijek, Croatia

⁴ University of Applied Sciences Velika Gorica, Velika Gorica, Croatia

aleksandar.racz@zvu.hr

Abstract

Bees (*Apis mellifera*) are the main pollinators of many plants and play a key role in agriculture. Although bees are not targeted organisms in the use of protective agents in the field, unfortunately they are heavily influenced by pesticides. The objectives of this study were to determine the species and concentration of pesticides in bees, and whether there were differences in levels of insecticides and fungicides. In total, 40 samples from 4 regions of Varazdin County were analysed, as well as two control samples from the Sisak-Moslavina County (Lonjsko Polje) and Karlovac County (Bosiljevo). Each of the samples was analysed on 78 active substances using gas chromatography with GC-MS mass spectrometry and highly effective liquid chromatography HPLC technique. The samples were prepared using the modified Quechers method EN 15662:2018. Fifteen different active pesticide substances were identified and quantified in 40 samples. The mass content of pesticides in bee samples was 0.035 – 295 µg/bees. The results obtained and the identified differences in fungicide levels related to the location distribution in bee samples indicate a significant difference in

fungicide levels in bee samples ($P = 0.039$), while there is no statistically significant difference in the analysed levels of insecticide. The pesticide residues were not identified in the control samples. This work contributes significantly to environmental protection by pointing out that honey bees are an excellent bioindicator, and that they can be used to investigate environmental pollution with pesticides.

Keywords: bees, pesticide, bioindicators, GC-MS

6.3. BURDEN OF INFORMAL CAREGIVERS OF CHRONIC RESPIRATORY FAILURE PATIENTS IN CROATIA

Collegium Antropologicum. 2021;45(1):39-44

Benko S^{1,2}, Kolaric B^{3,4}, Tomasovic Mrčela N^{1,3,5}

¹ Alma Mater Europaea – ECM, Slovenia

² Special Hospital for Lung Disease, Zagreb, Croatia

³ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

⁴ Faculty of Medicine, University of Rijeka, Rijeka, Croatia

⁵ University of Split, Split, Croatia

snjezanabenko@windowslive.com

Abstract

The aim of this study was to determine the level of burden of informal caregivers of chronic respiratory failure patients measured by the Zarit Burden Interview Questionnaire (ZBI) and to identify overburdened informal caregivers who can become hidden patients. We recruited the respondents in two hospitals for lung disease and a home healthcare service in Zagreb during 2020. After they had been identified as primary informal caregivers who provided high intensity informal care for more than six months, they were asked to complete the Croatian version of the ZBI questionnaire and a question-naire on sociodemographic characteristics. We used descriptive methods for statistical analysis in this cross-sectional study. We presented the data in tables as absolute frequencies, percentages and measures of the central tendency, and graphically by using diagrams. The study included 150 informal caregivers. The majority were female, over 50 years of age with high school education. The largest percentage of informal caregivers was retired. The highest scores were given to the statements on worrying about future and patient dependency while the lowest scores were given to the statements on leaving the care to someone else and

feelings such as anger or embarrassment caused by the patient. The results of this study show that more than half of informal caregivers of chronic respiratory failure patients are moderately to severely burdened.

Keywords: burden, informal caregiving, chronic respiratory failure

6.4. EMERGING AND NEGLECTED VIRUSES OF ZOO NOTIC IMPORTANCE IN CROATIA

Pathogens. 2021;10:73. DOI:10.3390/pathogens10010073

Impact factor: 3.492

Vilibić Čavlek T^{1,2}, Barbić Lj³, Mrzljak A^{2,4}, Brnić D⁵, Klobučar A⁶, Ilić M¹, Janev Holcer N¹, Bogdanić M¹, Jemeršić L⁵, Stevanović V³, Tabain I¹, Krčmar S⁷, Vucelja M⁸, Prpić J⁵, Boljfečić M⁸, Jeličić P¹, Madić J³, Ferencak I¹, Savić V⁵

¹ Croatian Institute of Public Health, Zagreb, Croatia

² School of Medicine, University of Zagreb, Zagreb, Croatia

³ Faculty of Veterinary Medicine, University of Zagreb, Zagreb, Croatia

⁴ Merkur University Hospital, Zagreb, Croatia

⁵ Croatian Veterinary Institute, Zagreb, Croatia

⁶ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

⁷ Josip Juraj Strossmayer University of Osijek, Osijek, Croatia

⁸ Faculty of Forestry, University of Zagreb, Zagreb, Croatia

tatjana.vilibic-cavlek@hzjz.hr

Abstract

Several arboviruses have emerged in Croatia in recent years. Tick-borne encephalitis is endemic in continental counties; however, new natural micro-foci have been detected. Two autochthonous dengue cases were reported in 2010. West Nile virus emerged in 2012, followed by emergence of Usutu virus in 2013. Although high seroprevalence rates of Toscana virus have been detected among residents of Croatian littoral, the virus remains neglected, with only a few clinical cases of neuroinvasive infections reported. Lymphocytic choriomeningitis virus is a neglected neuroinvasive rodent-borne virus. So far, there are no reports on

human clinical cases; however, the seroprevalence studies indicate the virus presence in the Croatian mainland. Puumala and Dobrava hantaviruses are widely distributing rodent-borne viruses with sporadic and epidemic occurrence. Hepatitis E virus is an emerging food-borne virus in Croatia. After the emergence in 2012, cases were regularly recorded. Seropositivity varies greatly by region and population group. Rotaviruses represent a significant healthcare burden since rotavirus vaccination is not included in the Croatian national immunization program. Additionally, rotaviruses are widely distributed in the Croatian ecosystem. A novel coronavirus, SARS-CoV-2, emerged in February 2020 and spread rapidly throughout the country. This review focuses on emerging and neglected viruses of zoonotic importance detected in Croatia.

Keywords: arboviruses, rodent-borne viruses, hepatitis E virus, SARS-CoV-2, rotaviruses, rabies virus, epidemiology, Croatia

6.5. INVESTIGATION OF MILK QUALITY AFTER REMOVAL OF AFM₁ USING LACTIC ACID BACTERIA AND BETA-GLUCAN

Medica Jadertina. 2021;51(1):5-12

Pavlek Ž¹, Bošnjir J^{1,3}, Ivešić M¹, Serdar S¹, Kuharić Ž¹, Jakopović Ž², Frece J², Markov K², Čanak I², Racz A³

¹ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

² Faculty of Food and Food Technology and Biotechnology, University of Zagreb, Zagreb, Croatia

³ University of Applied Health Sciences, Zagreb, Croatia

aleksandar.racz@zvu.hr

Abstract

Contamination of milk with aflatoxin M₁ (AFM₁) is related to the feed for milking cows, which is contaminated with aflatoxin B₁ (AFB₁). Feed AFB₁ converts to AFM₁ by dehydrogenation. In this study, we used Lactic acid bacteria (LAB) isolated from raw milk and its products and commercial or laboratory-made beta-glucan isolated from yeast and oats to establish how these mycotoxin binders affect the quality of sterilised, long-life, 2.8% fat milk contaminated with 0.05 mg/L of AFM₁. We took the content of fats, carbohydrates, sugars (lactose), and proteins, and the calculated energy values for quality parameters. The mean energy value of the milk treated with AFM₁ binders ranged between 85.7% and 101.5% of the control, untreated milk, whereas the fat content ranged between 65.3% and 100.7%. The protein content ranged between 64.4% and 101.1%, carbohydrates between 83.1% and 103%, and lactose between 76.3% and 100.8%. The results indicated a good possibility of binding of AFM₁ with *Lactobacillus plantarum* bacteria, and 0.01% of β-glucan from oats was 0.005% of β-glucan isolated from yeast from *Saccharomyces cerevisiae* 20. These findings suggest that milk treated with these binders can be processed further and that

its treatment significantly reduces the risk of exposure through diet and the related economic damage.

Keywords: milk, aflatoxin M₁, mycotoxin binders, quality of milk

6.6. LIPOSOMAL ENCAPSULATION INCREASES THE EFFICACY OF AZITHROMYCIN AGAINST *CHLAMYDIA TRACHOMATIS*

Pharmaceutics. 2021;14(1):36. DOI:10.3390/pharmaceutics14010036

Impact factor: 6.321

Bogdanov A¹, Janovák L², Vraneš J^{3,4}, Meštrović T^{5,6}, Ljubin Sternak S^{3,4}, Cseh Z¹, Endrész V¹, Burián K¹, Vanić Ž⁷, Virok DP¹

¹ Albert Szent-Györgyi Health Center and Albert Szent-Györgyi Medical School, Szeged, Hungary

² Interdisciplinary Excellence Centre, Szeged, Hungary

³ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

⁴ School of Medicine, University of Zagreb, Zagreb, Croatia

⁵ Dr. Zora Profozić Polyclinic, Zagreb, Croatia

⁶ University Centre Varaždin, University North, Varaždin, Croatia

⁷ Faculty of Pharmacy and Biochemistry, University of Zagreb, Zagreb, Croatia

virok.dezso.peter@med.u-szeged.hu

Abstract

Chlamydia trachomatis (*C. trachomatis*) is an obligate intracellular bacterium linked to ocular and urogenital infections with potentially serious sequelae, including blindness and infertility. First-line antibiotics, such as azithromycin (AZT) and doxycycline, are effective, but treatment failures have also been reported. Encapsulation of antibiotics in liposomes is considered an effective approach for improving their local effects, bioavailability, biocompatibility and antimicrobial activity. To test whether liposomes could enhance the antichlamydial action of AZT, we encapsulated AZT in different surface-charged elastic liposomes (neutral, cationic and anionic elastic liposomes) and assessed their antibacterial potential against the *C. trachomatis* serovar D laboratory strain

as well as the clinical isolate *C. trachomatis* serovar F. A direct quantitative polymerase chain reaction (qPCR) method was used to measure chlamydial genome content 48 h post infection and to determine the recoverable chlamydial growth. All the liposomes efficiently delivered AZT to HeLa 229 cells infected with the laboratory *Chlamydia* strain, exhibiting the minimal inhibitory concentrations (MIC) and the minimal bactericidal concentrations (MBC) of AZT even 4-8-fold lower than those achieved with the free AZT. The tested AZT-liposomes were also effective against the clinical *Chlamydia* strain by decreasing MIC values by 2-fold relative to the free AZT. Interestingly, the neutral AZT-liposomes had no effect on the MBC against the clinical strain, while cationic and anionic AZT-liposomes decreased the MBC 2-fold, hence proving the potential of the surface-charged elastic liposomes to improve the effectiveness of AZT against *C. trachomatis*.

Keywords: *Chlamydia*, *Chlamydia trachomatis*, MBC, MIC, PCR, Tween 80, azithromycin, elastic liposomes, qPCR, surface charge

6.7. MICROBIOLOGICAL ANALYSIS OF INDOOR AND OUTDOOR AIR ON A PIG FARM IN SLAVONIA

Journal of Central European Agriculture. 2021;22(2):260-268

DOI:10.5513/JCEA01/22.2.3143

Impact Factor: 0.603

Augustin K¹, Tanuwidjaja I¹, Kovaček I², Majić I², Luković Z¹, Mrkonjić Fuka M¹

¹ Faculty of Agriculture, University of Zagreb, Zagreb, Croatia

² Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

mfuka@agr.hr

Abstract

Due to a large concentration of animals living in a relatively small area, air on pig farms can be contaminated by microorganisms which can have an adverse effect on animal and human health. To determine the microbiological air quality on a pig farm in Slavonia, as well as the differences in the microbiological air quality at different distances from the farm, air was sampled at five locations at the farm (nursery room, finishing rooms 1 and 2, service room, gestation room) and four locations at a distance of 1.5, 5, 10 and 15 m from the farm in July 2019. At each location, temperature and relative humidity were measured and air for microbiological analysis was collected in quadruplicates (n=36) by impaction method. The total aerobic mesophilic bacteria (AMB), as well as yeast and mould counts were determined on blood agar and Sabouraud dextrose agar, respectively, and expressed as CFU/m³. The AMB counts in all five farm locations, as well as the yeast and mould counts in nursery and finishing room 1 exceeded the reference values of 1.05x10³ CFU/m³ for AMB and 4.1x10² CFU/m³ for yeasts and moulds. Overall, the AMB load was significantly higher (P<0.01) in indoor when compared to the outdoor air, which was not the case with yeasts and moulds (P>0.05). In addition, the abundance of airborne AMB and yeasts and moulds decreased as the distance from the farm increased.

Keywords: pig farm, air quality, bioaerosols, aerobic mesophilic bacteria, yeasts and moulds

6.8. OCCURRENCE OF *P. AERUGINOSA* IN WATER INTENDED FOR HUMAN CONSUMPTION AND IN SWIMMING POOL WATER

Environments. 2021;8(12):132. Epub 24 November 2021

DOI:10.3390/environments8120132

Vukić Lušić D^{1,2,3}, Maestro N⁴, Cenov A², Lušić D^{1,3,5}, Smolčić K¹, Tolić S⁶, Maestro D^{7,8}, Kapetanović D⁹, Marinac Pupavac S², Tomić Linšak D^{1,2}, Linšak Ž^{1,2}, Glad M²

¹ Faculty of Medicine, University of Rijeka, Rijeka, Croatia

² Teaching Institute of Public Health of Primorje-Gorski Kotar County, Rijeka, Croatia

³ Center for Advanced Computing and Modeling, University of Rijeka, Rijeka, Croatia

⁴ Institute for Public Health of Canton Sarajevo, Sarajevo, Bosnia and Herzegovina

⁵ Faculty of Health Studies, University of Rijeka, Rijeka, Croatia

⁶ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

⁷ Institute for Public Health of the Federation of Bosnia and Herzegovina, Sarajevo, Bosnia and Herzegovina

⁸ Faculty of Health Studies, University of Sarajevo, Sarajevo, Bosnia and Herzegovina

⁹ Ruđer Bošković Institute, Zagreb, Croatia

arijana.cenov@zzjzpgz.hr

Abstract

Considering the fact that water is a basic need of every living being, it is important to ensure its safety. In this work, the data on the presence of the opportunistic pathogen *P. aeruginosa* in drinking water (n = 4171) as well as in pool water (n =

5059) in Primorje-Gorski Kotar County in Croatia in the five-year period (2016–2020) were analysed. In addition, the national criteria were compared with those of neighboring countries and worldwide. The proportion of *P. aeruginosa* positive samples was similar for drinking water (3.9%) and pool water (4.6%). The prevalence of this bacterium was most pronounced in the warmer season. *P. aeruginosa*-positive drinking water samples were mostly collected during building commissioning, while pool samples were from entertainment and spa/hydromassage pools. Outdoor pools showed a higher percentage of positive samples than indoor pools, as well as the pools filled with freshwater rather than seawater. The highest *P. aeruginosa* load was found in rehabilitation pools. Croatia, Serbia and Montenegro are countries that have included *P. aeruginosa* in their national regulations as an indicator of the safety of water for human consumption as well as for bottled water, while Slovenia and Bosnia and Herzegovina have limited this requirement to bottled water only. In the case of swimming pool water, this parameter is mandatory in all countries considered in this study.

Keywords: water safety, drinking water, swimming pool water, microbiological parameters, water quality criteria

6.9. PARVOVIRUS B19 IN CROATIA: A LARGE-SCALE SEROPREVALENCE STUDY

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Vilibić Čavlek T^{1,2}, Tabain I¹, Kolarić B^{3,4}, Mihulja K⁵, Blažević L¹, Bogdanić M¹, Navolan D⁶, Beader N^{2,7}, Mrzljak A^{2,7}

¹ Croatian Institute of Public Health, Zagreb, Croatia

² School of Medicine, University of Zagreb, Zagreb, Croatia

³ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

⁴ Faculty of Medicine, University of Rijeka, Zagreb, Croatia

⁵ Zagreb County Family Medicine Division, Zagreb, Croatia

⁶ “Victor Babes” University of Medicine and Pharmacy, Timisoara, Romania

⁷ University Hospital Center, Zagreb, Croatia

tatjana.vilibic-cavlek@hzjz.hr

Abstract

Background and Objectives: Seroepidemiological studies indicate that parvovirus B19 circulates in all areas of the world, although with some differences. The aim of this study is to analyze the seroprevalence of parvovirus B19 in the Croatian population.

Materials and Methods: From 2010 to 2021, 1538 serum samples from different populations were tested for the presence of parvovirus B19 IgM/IgG antibodies. Serological tests were performed using a commercial enzyme-linked immunosorbent assay.

Results: IgG antibodies were detected in 986/64.1% of participants with differences ($p < 0.001$) among the following population groups: 42.4% of children and adolescents, 67.1% of the adult general population, 66.7% of hemodialysis

patients, and 65.6% of liver transplant recipients. Seroprevalence increased with age, from 30.0% in the 6 months–9 years age group to 69.0% in the 40–49 years age group, and remained stable thereafter (68.8–73.3%). There was no difference in the seropositivity among males (66.1%) and females (63.1%), as well as the place of residence (suburban/rural 63.9%, urban 64.1%). IgM antibodies (current/recent infection) were found in 61/4.0% of participants with the highest seropositivity in the youngest age group (11.1%). In pregnant women, seroprevalence was higher in women with an unfavorable obstetric history compared with a normal pregnancy (IgG 71.0% vs. 62.6%; IgM 6.5% vs. 2.4%), but these differences were not significant. Logistic regression showed that the adult population had almost three times higher risk of IgG seropositivity compared to children/adolescents (general population OR = 2.777, 95% CI = 2.023–3.812; hemodialysis patients OR = 2.586, 95% CI = 1.531–4.367; and transplant patients OR = 2.717, 95% CI = 1.604–4.603). A one-year increase in age increased the risk of IgG seroprevalence (OR = 1.017; 95% CI = 1.011–1.022).

Conclusions: Older age was the main risk factor for IgG seropositivity. Hemodialysis and organ transplantation seem unrelated to the increased parvovirus B19 seroprevalence. The role of parvovirus B19 in the etiology of TORCH infections needs to be studied further.

Keywords: parvovirus B19, seroprevalence, Croatia, pregnancy, hemodialysis, transplant

6.10. PREVALENCE AND MOLECULAR CHARACTERIZATION OF HUMAN BOCAVIRUS DETECTED IN CROATIAN CHILDREN WITH RESPIRATORY INFECTION

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Ljubin Sternak ^{S^{1,2}}, **Slović A** ^{A³}, **Mijač M** ^{M^{1,2}}, **Jurković M** ^{M³}, **Forčić D** ^{D³}, **Ivković Jureković I** ^{I^{4,5}}, **Tot T** ^{T⁶}, **Vraneš J** ^{J^{1,2}}

¹ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

² School of Medicine, University of Zagreb, Zagreb, Croatia

³ Center of Excellence for Virus Immunology and Vaccines, University of Zagreb, Zagreb, Croatia

⁴ Children's Hospital Zagreb, Zagreb, Croatia

⁵ Faculty for Dental Medicine and Healthcare, Josip Juraj Strossmayer University of Osijek, Osijek, Croatia

⁶ General Hospital Karlovac, Karlovac, Croatia

sljsternak@stampar.hr

Abstract

Human bocavirus (HBoV) 1 is considered an important respiratory pathogen, while the role of HBoV2-4 in clinical disease remains somewhat controversial. Since, they are characterized by a rapid evolution, worldwide surveillance of HBoVs' genetics is necessary. This study explored the prevalence of HBoV genotypes in pediatric patients with respiratory tract infection in Croatia and studied their phylogeny. Using multiplex PCR for 15 respiratory viruses, we investigated 957 respiratory samples of children up to 18 years of age with respiratory tract infection obtained from May 2017 to March 2021 at two different hospitals in Croatia. Amplification of HBoV near-complete genome or three overlapping fragments was performed, sequenced, and their phylogenetic

inferences constructed. HBoV was detected in 7.6% children with a median age of 1.36 years. Co-infection was observed in 82.2% samples. Sequencing was successfully performed on 29 HBoV positive samples, and all belonged to HBoV1. Croatian HBoV1 sequences are closely related to strains isolated worldwide, and no phylogenetic grouping based on mono- or co-infection cases or year of isolation was observed. Calculated rates of evolution for HBoV1 were 10^{-4} and 10^{-5} substitutions per site and year. Recombination was not detected among sequences from this study.

Keywords: bocavirus, respiratory tract, prevalence, Croatia, phylogeny, recombination

6.11. RABIES IN THE MIDDLE EAST, EASTERN EUROPE, CENTRAL ASIA AND NORTH AFRICA: BUILDING EVIDENCE AND DELIVERING A REGIONAL APPROACH TO RABIES ELIMINATION

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¹ School of Veterinary Medicine, University of Surrey, Guildford, UK

² Global Alliance for Rabies Control, South Africa

³ Faculty of Natural and Agricultural Sciences, University of Pretoria, South Africa

⁴ Pasteur Institute of Iran (IPI), Tehran, Iran

⁵ Ministry of Agriculture, Palestine

⁶ Ministry of Public Health, Beirut, Lebanon

⁷ Ministry of Agriculture, Beirut, Lebanon

⁸ Institut Pasteur Du Maroc, Casablanca, Morocco

⁹ Moroccan Association for the Fight Against Rabies (AMLR), Morocco

¹⁰ Ministry of Health and Social Protection of Population of the Republic of Tajikistan, Dushanbe, Tajikistan

¹¹ Ministry of Health, Tunis, Tunisia

¹² National Centre for Disease Control and Public Health, Tbilisi, Georgia

¹³ Institut Pasteur d'Algerie, Alger, Algeria

¹⁴ Ministry of Health (Kimadia), Baghdad, Iraq

¹⁵ National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine

¹⁶ Global Alliance for Rabies Control, New York, USA

¹⁷ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

¹⁸ Pasteur Institute Novi Sad, Novi Sad, Serbia

¹⁹ Merieux Foundation, Lyon, France

d.horton@surrey.ac.uk

Abstract

The Middle East, Eastern Europe, Central Asia and North Africa Rabies Control Network (MERACON), is built upon the achievements of the Middle East and Eastern Europe Rabies Expert Bureau (MEEREB).

MERACON aims to foster collaboration among Member States (MS) and develop shared regional objectives, building momentum towards dog-mediated rabies control and elimination. Here we assess the epidemiology of rabies and preparedness in twelve participating MS, using case and rabies capacity data for 2017, and compare our findings with previous published reports and a predictive burden model.

Across MS, the number of reported cases of dog rabies per 100,000 dog population and the number of reported human deaths per 100,000 population as a result of dog-mediated rabies appeared weakly associated. Compared to 2014 there has been a decrease in the number of reported human cases in five of the twelve MS, three MS reported an increase, two MS continued to report zero cases, and the remaining two MS were not listed in the 2014 study and therefore no comparison could be drawn. Vaccination coverage in dogs has increased since 2014 in half (4/8) of the MS where data are available. Most importantly, it is evident that there is a need for improved data collection, sharing and reporting at both the national and international levels.

With the formation of the MERACON network, MS will be able to align with international best practices, while also fostering international support with other MS and international organisations.

Keywords: MEEREB, MERACON, rabies, epidemiology

6.12. THE RISK ASSESSMENT OF PESTICIDE INGESTION WITH FRUIT AND VEGETABLES FOR CONSUMER'S HEALTH

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Jurak G¹, Bošnjir J¹, Đikić D², Mojsović Ćuić A³, Pavlinić Prokurica I⁴, Racz A³, Jukić T⁵, Stubljar D^{6,7}, Starc A⁸

¹ Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

² Faculty of Science, University of Zagreb, Zagreb, Croatia

³ University of Applied Health Sciences, Zagreb, Croatia

⁴ Croatian Agency for Agriculture and Food, Zagreb, Croatia

⁵ Faculty of Medicine, University Josip Juraj Strossmayer, Osijek, Croatia

⁶ In-Medico, Metlika, Slovenia

⁷ Faculty of Medicine Ljubljana, University of Ljubljana, Ljubljana, Slovenia

⁸ Faculty of Health Sciences, University of Ljubljana, Ljubljana, Slovenia

aleksandar.racz@zv.u.hr

Abstract

Pesticides are chemicals used in agriculture to protect crops from pests. In addition to protection during cultivation, they are also used after harvesting to extend the shelf life of products. Postharvest control stands out, especially when it comes to products imported from distant countries, resulting in increased concentration of pesticides and risk to human health consuming such products. In this study, analyses of pesticide residues were performed on 200 samples of fruits and vegetables. Pesticide residues were identified and quantified in 30 out of 200 samples. Study results revealed imazalil to be the most frequently detected pesticide. Risk assessment was performed on the obtained results, and

it was carried out separately for adults and for children under 6 years of age. Imazalil showed the highest ARfD percentage for adults (max % ARfD 251%), and these values were especially high on risk assessment for children, where they amounted up to max % ARfD 1087%. The study of imazalil impact was performed on 16 Swiss albino mice divided into two groups and 4 subgroups. Experimental group animals were treated with the corresponding NOAEL dose of imazalil (10 mg/kg) for 28 days. Body weight was measured before each pesticide application on a digital electronic Sartorius scale. Peripheral blood analysis was performed after 28-day animal exposure to pesticides. Animals were anesthetized, blood samples were obtained by cardiac puncture, and red blood cell (RBC) count, hemoglobin (Hb) concentration, and white blood cell (WBC) count were determined by standard hematological methods. The organs for determination of imazalil concentration were extracted immediately upon animal sacrifice and stored in a freezer at -80 °C until analysis. Results show difference in gain weight, and an increase in WBC count was recorded in the experimental group as compared with a control group of animals. The highest imazalil levels were recorded in adipose tissue (45.2%) which proves tendency to accumulate.

Keywords: risk assessment, pesticide, fruit, vegetables

6.13. UNIVARIABLE ASSOCIATIONS BETWEEN A HISTORY OF INCARCERATION AND HIV AND HCV PREVALENCE AMONG PEOPLE WHO INJECT DRUGS ACROSS 17 COUNTRIES IN EUROPE 2006 TO 2020 – IS THE PRECAUTIONARY PRINCIPLE APPLICABLE?

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Wiessing L¹, (...), Kolaric B^{2,3}, et al

¹ European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), Lisbon, Portugal

² Andrija Stampar Teaching Institute of Public Health, Zagreb, Croatia

³ Medical Faculty, University of Rijeka, Rijeka, Croatia

lucas.wiessing@emcdda.europa.eu

Abstract

Background: People who inject drugs (PWID) are frequently incarcerated, which is associated with multiple negative health outcomes.

Aim: We aimed to estimate the associations between a history of incarceration and prevalence of HIV and HCV infection among PWID in Europe.

Methods: Aggregate data from PWID recruited in drug services (excluding prison services) or elsewhere in the community were reported by 17 of 30 countries (16 per virus) collaborating in a European drug monitoring system (2006–2020; n=52,368 HIV+/-; n=47,268 HCV+/-). Country-specific odds ratios (OR) and prevalence ratios (PR) were calculated from country totals of HIV and HCV antibody status and self-reported life-time incarceration history, and pooled using meta-analyses. Country-specific and overall population attributable risk (PAR) were estimated using pooled PR.

Results: Univariable HIV OR ranged between 0.73 and 6.37 (median: 2.1; pooled OR: 1.92; 95% CI: 1.52–2.42). Pooled PR was 1.66 (95% CI 1.38–1.98), giving a PAR of 25.8% (95% CI 16.7–34.0). Univariable anti-HCV OR ranged between 1.06 and 5.04 (median: 2.70; pooled OR: 2.51; 95% CI: 2.17–2.91). Pooled PR was 1.42 (95% CI: 1.28–1.58) and PAR 16.7% (95% CI: 11.8–21.7). Subgroup analyses showed differences in the OR for HCV by geographical region, with lower estimates in southern Europe.

Conclusion: In univariable analysis, a history of incarceration was associated with positive HIV and HCV serostatus among PWID in Europe. Applying the precautionary principle would suggest finding alternatives to incarceration of PWID and strengthening health and social services in prison and after release (*throughcare*).

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