

ABSTRACT BOOK

6th Summit Tobacco Harm Reduction

Novel products, Research & Policy

by **S@HRE**

25-26 SEPTEMBER 2023 | ATHENS
ROYAL OLYMPIC HOTEL

#NoSmokeSummit23
www.nosmokesummit.org

CONTENTS

37 ORAL PRESENTATIONS

- RESEARCH TRACK SESSION I | MONDAY 25/9/2023, 09:30-11:00
 - EDUCATIONAL ISSUES IN ADOLESCENCE [OP01]
 - SMOKING CESSATION [OP02 - OP09]
- RESEARCH TRACK SESSION II | MONDAY 25/9/2023, 15:30-16:30
 - CLINICAL ASSESSMENT AND HARM REDUCTION [OP10 - OP15]
- RESEARCH TRACK SESSION III | TUESDAY 26/9/2023, 09:00-11:00
 - EPIDEMIOLOGY & SOCIAL ISSUES
(Perception risk, Attractiveness etc.) [OP16 - OP20]
 - BIOMARKERS' EVALUATION IN ANIMAL OR HUMAN STUDIES [OP21 - OP27]
- RESEARCH TRACK SESSION IV | TUESDAY 26/9/2023, 15:30-16:30
 - TOXICOLOGY AND AEROSOL CHEMISTRY
Chemical composition of the aerosol, droplet size and distribution, temperature and toxicants, indoor air quality [OP28]
 - INNOVATION & NOVEL PRODUCTS [OP29]
 - PRECLINICAL EVALUATION [OP30 - OP31]
 - REGULATORY ISSUES [OP32 - OP33]

75 POSTER PRESENTATIONS

- RESEARCH TRACK - POSTER SESSION I | MONDAY 25/9/2023, 13:30-14:30
 - CLINICAL ASSESSMENT AND HARM REDUCTION [PP01 - PP04]
- RESEARCH TRACK - POSTER SESSION II | TUESDAY 26/9/2023, 13:30-14:30
 - SMOKING CESSATION [PP05]
 - EPIDEMIOLOGY & SOCIAL ISSUES
(Perception risk, Attractiveness etc.) [PP06 - PP09]
 - TOXICOLOGY AND AEROSOL CHEMISTRY
Chemical composition of the aerosol, droplet size and distribution, temperature and toxicants, indoor air quality [PP10 - PP11]
 - PRECLINICAL EVALUATION [PP12]

89 AUTHORS' INDEX

6th Summit Tobacco Harm Reduction

Novel products, Research & Policy

25-26 SEPTEMBER 2023 | ATHENS
ROYAL OLYMPIC HOTEL

ORAL PRESENTATIONS

ABSTRACT BOOK

EDUCATIONAL ISSUES IN ADOLESCENCE

EVALUATION OF THE LONG-TERM PERSPECTIVE AND EFFECTIVENESS OF THE WORK OF LOCAL SCHOOLS ON SMOKING CESSATION

Natalya Esaulova

OP 01

Ural Research Institute of
Phthisiopulmonology, Ural State
Medical University, Russian
Federation

Background: The purpose of this study is to assess the long-term perspective and effectiveness of the work of local smoking cessation schools as part of formation a global strategy for quitting tobacco smoking in society.

Material and Methods: The study was conducted in the pulmonological department of Clinical Hospital. Total number of patients was 97, separated in 2 groups. Group 1 included patients with COPD: 1A continue to smoke cigarettes, 1B transferred to THS. Group 2 included patients without respiratory symptoms: 2A continue to smoke cigarettes, 2B transferred to THS. Work of the school included: medical, laboratory, functional examinations, lectures and practical classes. Schools were assessed at 6, 12, 24, and 36 months. Primary endpoint: avoiding smoking cigarette within 6 months. Secondary endpoints: lung function, frequency of exacerbations of COPD during the year, quality of life, level of exercise tolerance.

Results: Primary endpoint reached: in group 1 in 93% at 24 months of observation: 1A 3%, 1B 90%, in group 2 in 72% at 36 months: 2A 5%, 2B 67%. The marker of lack effect from schools was the number of patients dropping out: First 3 months - 12 patients in group 1A; 10 patients in group 2A; in groups B there were no drop-outs for the first 3 months. Total number of drop-outs from the program in the first year: 52 patients.

Conclusions: Continued smoking of cigarettes leads to a rapid decrease in lung function, and progressive increase of broncho-obstructive syndrome, number of exacerbations, and development of neoplasms. Tobacco cessation schools have a positive effect on the health of the population and in the group switching to TSH effectiveness is higher, which has a beneficial effect on reducing frequency of respiratory events.

ABSTRACT BOOK

SMOKING CESSATION

TOBACCO HARM REDUCTION, CROATIAN APPROACH, PRESENT AND FUTURE

Ranko Stevanovic

OP 02

HaRPH, Zagreb, Croatia

Croatian Society for the Harm Reduction in Public Health (HaRPH) was the first in Croatia to seriously point out the lack of a serious comprehensive set of principles, policies, programs and practices and products for reducing the damage associated with tobacco use. According to the results of the independent market research agency during May 2022, smokers of classic cigarettes (58.2%), compared to users of alternative products, are significantly more concerned about their health due to the products they use. 60% of respondents who have tried alternative tobacco products believe that such products are less harmful, while only a quarter of smokers of classic cigarettes believe that alternative products are less harmful compared to cigarettes. Almost half of all respondents believe that the legislation must be less restrictive towards less harmful tobacco products compared to conventional cigarettes. HaRPH is preparing a Croatian budget impact study: "Harm Reduction. Switching from tobacco-based products to heated tobacco-based products in smokers (nicotine addicts) who are unwilling or unable to quit smoking". The study will calculate, for the first time in Croatia and the EU, the impact on the insurer's budget when people who are unwilling or unable to quit smoking switch from tobacco-based products to heated tobacco-based products, according to the same methodology used by Croatian National Health Insurance Fund for decision-making on the placing of medicinal products and medical devices on the List of medicinal products.

ABSTRACT BOOK

SMOKING CESSATION

BARRIERS TO ABANDONING CIGARETTE SMOKING 2022 – A SURVEY AMONG ADULT SMOKERS AND USERS OF E-CIGARETTES AND HEATED TOBACCO PRODUCTS IN GERMANY

Nelson Tewes, Christoph Neubert, **Alexander K. Nussbaum**

OP 03

Philip Morris GmbH

Conflict of Interest:
C. Neubert, A. K. Nussbaum & N. Tewes are employees of Philip Morris Germany.

Funding:
Philip Morris International is the sole source of funding and sponsor of this research.

Background: In Germany, 32.4% of the population smokes, despite the well-known serious health effects. Regardless, smoking rates have been stable or slightly increasing since 2016. The study aims to assess and understand the barriers that may impede adult smokers from quitting cigarette smoking.

Material and Methods: Between October and November 2022, computer-assisted web interviews were conducted in Germany with a representative sample of 1,000 smokers aged 19 years and above. Additionally, 196 adult users of e-cigarettes and heated tobacco products (HTPs) who switched from cigarette smoking were surveyed.

Results: More than half of the smokers surveyed, reported not being motivated to quit cigarette smoking (51%), while 5% expressed a desire to quit within the next month. Older smokers and smokers with a low household income reported no motivation to quit more often. The most frequently reported barriers to quitting cigarette smoking were enjoyment of smoking (50%), difficulties in breaking habits and rituals (41%), and lack of discipline (31%). Roughly a quarter (27%) of smokers assessed the health risks of e-cigarettes and HTPs to be lower than that of cigarettes. Respondents who discontinued cigarette smoking by switching to smoke-free alternatives were significantly better informed on the causes of smoking related harm (85%, $p < 0.05$). Within the sample of e-cigarette and HTP users, 42% reported a period of dual use while switching away from cigarettes. For the vast majority (89%), this period lasted less than a year, with 96% reporting a reduction in cigarette consumption during this period.

Conclusions: The majority of the smokers surveyed were not motivated to quit smoking. The barriers mentioned need to be considered when developing measures to help smokers quit cigarette smoking. Misperceptions about the cause of harm from cigarette smoking and the health risks of smoke-free alternatives in relation to cigarettes are persistent in our smoker sample.

ABSTRACT BOOK

SMOKING CESSATION

COMPARING THE EFFECTIVENESS, TOLERABILITY, AND ACCEPTABILITY OF HEATED TOBACCO PRODUCTS AND REFILLABLE ELECTRONIC CIGARETTES FOR CIGARETTE SUBSTITUTION (CEASEFIRE): RANDOMIZED CONTROLLED TRIAL

Pasquale Caponnetto

OP 04

University of Catania, Italy

Background: People who smoke and who face challenges trying to quit or wish to continue to smoke may benefit by switching from traditional cigarettes to non-combustible nicotine delivery alternatives, such as heated tobacco products (HTPs) and electronic cigarettes (ECs). HTPs and ECs are being increasingly used to quit smoking, but there are limited data about their effectiveness.

Material and Methods: We conducted a 12-week randomized non-inferiority switching trial to compare effectiveness, tolerability, and product satisfaction between HTPs (IQOS 2.4 Plus) and refillable ECs (JustFog Q16) among people who do not intend to quit. The cessation intervention included motivational counseling. The primary endpoint of the study was the carbon monoxide-confirmed continuous abstinence rate from week 4 to week 12 (CAR weeks 4-12). The secondary endpoints included the continuous self-reported $\geq 50\%$ reduction in cigarette consumption rate from week 4 to week 12 (CRR weeks 4-12) and 7-day point prevalence of smoking abstinence.

Results: A total of 211 participants completed the study. High quit rates (CAR weeks 4-12) of 39.1% (43/110) and 30.8% (33/107) were observed for IQOS-HTP and JustFog-EC, respectively. The between-group difference for the CAR weeks 4-12 was not significant ($P=0.20$). The CRR weeks 4-12 values for IQOS-HTP and JustFog-EC were 46.4% (51/110) and 39.3% (42/107), respectively, and the between-group difference was not significant ($P=0.24$). At week 12, the 7-day point prevalence of smoking abstinence values for IQOS-HTP and JustFog-EC were 54.5% (60/110) and 41.1% (44/107), respectively. The most frequent adverse events were cough and reduced physical fitness. A clinically relevant improvement in exercise tolerance was observed after switching to the combustion-free products under investigation. Risk perception for conventional cigarettes was consistently higher than that for the combustion-free study products under investigation.

Conclusions: HTPs may be a useful addition to the arsenal of reduced-risk alternatives for tobacco cigarettes and may contribute to smoking cessation.

ABSTRACT BOOK

SMOKING CESSATION

EFFECTIVENESS OF INDIVIDUAL COUNSELING FOR SMOKING CESSATION IN PATIENTS WITH COPD

Irina Kroshkina, Nataliia Kuzubova, Viktoriia Makhmutova, Ekaterina Pirozhkova, Natalia Refitskaia

OP 05

Saint Petersburg City
Multidisciplinary Hospital No.
2, Saint Petersburg, Russian
Federation

Background: According to official data from the RPORC survey in Russia from 2017 to 2022, the total number of smokers (33%) remained unchanged, while the share of those who answered “I don’t intend to quit” has doubled. Our purpose was to study the effectiveness of individual physician consultation on the motivation to quit smoking in patients with COPD and the need for stepwise approach in patients with low motivation.

Material and Methods: Questionnaire survey of 52 COPD patients with 20 questions about smoking history, personal experience, and physician’s role in smoking cessation.

Results: 40 men (76.9%; mean age, 66.6 years); 12 women (23.1%; mean age, 63.3 years) were included. No differences were found in the “age of smoking initiation” indicator (women-19.7 years; men-17.2 years). 82.6% (43) of patients had at least one attempt to stop smoking. Among smoking patients, 69.2% (36) would stop smoking if it is easy. 7.7% (4) of patients purposefully sought medical advice and 57.7% (30) of patients had individual medical consultation about the tobacco harm when contacting a medical center. There is a positive correlation between “individual doctor’s consultation about the dangers of smoking” and “motivation to quit smoking” ($p < 0.05$). There is a positive tendency between the smoking cessation indicators ($p = 0.07$) and the motivation to stop smoking ($p = 0.08$). 25% (13) of the patients are not motivated to stop smoking.

Conclusions: Individual physician consultation is a highly effective part of a COPD patient’s smoking cessation motivation, which is confirmed by the results of this study. All patients, including those with low motivation, should be able to get qualified help, and there should be special approaches for this group, possibly with the use of stepwise approach in smoking cessation and using the concept of “risk modification”.

PROBLEMS OF SMOKING CESSATION IN COPD PATIENTS

Nataliia Shapороva¹, Irina Pelevina², Aleksandr Kakanov²

OP 06

¹First St. Petersburg State Medical University named after academician Ivan Petrovich Pavlov, Saint Petersburg, Russian Federation

²Saint Petersburg City Polyclinic No. 54, Saint Petersburg, Russian Federation

Background: Our purpose was to study the peculiarities of smoking cessation in COPD patients in outpatient practice.

Material and Methods: 140 smoking COPD patients (mean age 54.5±6.7 years) were examined in the anti-smoking office of City Polyclinic No. 54 in Saint-Petersburg. All patients were assessed on their level of nicotine addiction (Fagerström test) and motivation to quit smoking (Prochaska questionnaire), underwent clinical-laboratory testing, spirometry, and were trained in school on smoking cessation. All participants had moderate airflow limitation and received basic therapy with long-acting bronchodilators according to clinical guidelines. Patients, depending on motivation to quit smoking, were divided into three groups: with initially high (12 people), insufficient (56 people) and low (72 people) motivation.

Results: Group 1 patients had a study period of 3 months, all patients were able to quit tobacco smoking, and after 6 months showed an improvement in FEV1 (2.1±0.58 and 2.44±0.62, respectively, p<0.05). Group 2 patients had a study period of 6 to 15 months, during which their motivation to quit smoking increased and then they quit smoking. Patients in this group had lower FEV1 at the end of the preparatory period compared with group 1 (1.84±0.34, p<0.05), but improved after 6 months of abstinence (2.36±0.52, p<0.05). Group 3 patients with low motivation, after selection of baseline COPD therapy, stopped attending the anti-smoking office and continued smoking.

Conclusions: 1. The study showed that not all patients were motivated to quit smoking, despite individual counseling by physicians and classes in cessation school. 2. Patients in groups 1 and 2 were able to quit smoking, which indicates the effectiveness of the study. 3. In patients unmotivated to quit smoking (group 2 patients during preparatory period of training and group 3 patients given cessation), it is reasonable to apply the harm reduction concept to minimize the harm from smoking.

ABSTRACT BOOK

SMOKING CESSATION

SMOKING CESSATION FOR PEOPLE WITH SEVERE MENTAL ILLNESS. A PILOT RANDOMIZED CONTROLLED TRIAL

Georgia Papadosifaki^{1,2}, Evanthia Sakellari², Areti Lagiou², Anastasia Barbouni²

OP 07

¹Psychiatric Hospital of Attica, Greece

²Specialized Research Unit in Smoking Behavior, Laboratory of Hygiene and Epidemiology, Department of Public and Community Health, School of Public Health, University of West Attica, Greece

Background: Endemic in people with mental disorders, smoking increases the risk of morbidity and premature mortality due to tobacco-related diseases. The overarching objective of the present study was to assess the feasibility and acceptability of smoking cessation interventions or tobacco harm reduction strategies among smokers with severe mental illness.

Material and Methods: To assess e-cigarettes as a tobacco harm reduction strategy and its overall impact on participants' physical and mental health, a pilot randomized controlled trial was conducted in smokers with severe mental disorder (n=43). The study protocol and all procedures were approved by the Ethics and Scientific Committee of the Psychiatric Hospital of Attica and the Research Ethics Committee of the University of West Attica. Using a simple randomization procedure, participants were 1:1 assigned to intervention or control group. The primary outcome was self-reported smoking cessation, biochemically validated by exhaled carbon monoxide levels of below 6 ppm in 6 months. Secondary outcome measures were the Fagerström Test for Nicotine Dependence, the World Health Organization Quality of Life – BREF and the 36-Item Short Form Health Survey. The control group (n=22) and the intervention group (n=21) were given the same behavioral support for at least 3 months. Finally, the intervention group participants received a starter kit (e-cigarette and bottle of nicotine e-liquid) and were encouraged to use it as a smoking cessation tool.

Results: Compared to baseline, a significant reduction in nicotine dependence was observed in both groups in 6 months. However, the intervention group exhibited a remarkably higher quit rate over said period (33.3%) than the control group (13.6%). Overall, the intervention group's QoL and general health demonstrated significant improvement in 6 months.

Conclusions: Concluding, through a tailored smoking cessation intervention, smokers with mental disorders can acquire skills to manage their nicotine addiction and succeed in quitting smoking or reducing smoking-related harm.

SMOKING CESSATION TRAINING PROGRAM FOR NURSES

Evmorfia Koukia¹, **Polyxeni Mangoulia¹**, Maria Topi²

OP 08

¹Faculty of Nursing, National and Kapodistrian University of Athens, Greece
²Eginitio Hospital, Athens, Greece

Background: Smoking is the biggest epidemic of our time. According to the World Health Organization (WHO), tobacco causes over 6 million premature deaths every year. The potential of nurses in preventative healthcare has mostly gone untapped. Major barriers to nurses' involvement in helping patients quit smoking include a lack of time and training. The aim of the program was training nurses of general and psychiatric hospitals in smoking cessation techniques.

Material and Methods: The educational program lasted 3 months and was performed as synchronous and asynchronous distance learning. Twenty-five nurses from 4 hospitals in Athens (2 general and 2 psychiatric hospitals) participated the program.

Results: As part of the program, trainee nurses met specific cases (vignettes), study smoking and its effects and practice smoking cessation techniques. The majority of participants reported that they were completely satisfied with the program in terms of understanding the effects of smoking (64%) and smoking cessation techniques (77%).

Conclusions: Every nurse should speak with their patients about quitting smoking, according to National Institute for Health and Clinical Excellence (NICE) guidelines. This is a crucial public health duty, but to carry it out, nurses must comprehend the causes of and obstacles to quitting smoking. The alternatives accessible to support the patient must also be known by nurses.

ABSTRACT BOOK

SMOKING CESSATION

POTENTIAL EFFECTS OF CIGARETTES AND E-CIGARETTES: HYPERMETHYLATION OF PROMOTER P16 AND ITS CORRELATION WITH CHARACTERISTIC ALTERATIONS IN NORMAL HUMAN LUNG CELL (MRC-5)

Xylia-Annisa Abelia¹, Ronny Lesmana^{2,3,4}, Melisa-Intan Barliana^{1,4}, Riccardo Polosa^{5,6}

OP 09

¹Department of Biological Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Bandung, Indonesia

²Department of Biomedical Sciences, Faculty of Medicine, Universitas Padjadjaran, Bandung, Indonesia

³Physiology Molecular Laboratory, Biological Activity Division, Central Laboratory, Universitas Padjadjaran, Bandung, Indonesia

⁴Center of Excellence for Pharmaceutical Care Innovation, Universitas Padjadjaran, Bandung, Indonesia

⁵Centro per la Prevenzione e Cura del Tabagismo (CPCT), University Teaching Hospital "Policlinico-Vittorio Emanuele", University of Catania, Italy

⁶Center of Excellence for the Acceleration of Harm Reduction (CoEHAR), University of Catania, Italy

Exposure to cigarette smoke contributes to the development of lung cancer. Cigarette products are offered in two distinct systems: cigarettes and e-Cigs. e-Cig products have quickly become the new craze among people. A prevalent fallacy exists regarding the absence of risks associated with e-Cig. Cigarettes and e-Cigs produce free radicals, which cause gene promoter hypermethylation and cancer. Prior studies have primarily examined the impact of e-Cig on the growth of lung carcinoma cells. Hence, this study conducts a comparative analysis to examine the impact of cigarette and e-Cigs exposure on alterations of lung cells' characteristics. The finding indicates that the effects of ECVE and CSE are similar. The extract was obtained via bubbling media technique. CSE and ECVE reduced lung cell viability in 24 hours and induce morphological alterations. CSE and ECVE induced hypermethylation of the p16 promoter. Numerous factors, such as composition and usage techniques, have an impact on the varying degrees of toxicological effects of CSE and ECVE. As with cigarettes, long-term use of e-cigarettes increases the risk of lung cancer.

ABSTRACT BOOK

CLINICAL ASSESSMENT AND HARM REDUCTION

COMBUSTIBLE CIGARETTES AND ELECTRONIC NICOTINE DELIVERY DEVICES MODULATE PHENOTYPE AND FUNCTION OF MURINE LUNG-INFILTRATED IMMUNE CELLS, AFFECTING PROGRESSION OF CHRONIC LUNG INFLAMMATION

Nikolina Kastratovic¹, Vladimir Markovic¹, Aleksandar Arsenijevic¹, Ana Volarevic¹, Milica Dimitrijevic-Stojanovic², Vladimir Jakovljevic³, Vladislav Volarevic¹

OP 10

¹Center for Harm Reduction of Biological and Chemical Hazards, Faculty of Medical Sciences, University of Kragujevac, Serbia

²Department of Pathology, Faculty of Medical Sciences, University of Kragujevac, Serbia

³Department of Physiology, Faculty of Medical Sciences, University of Kragujevac, Serbia

In this experimental study, we used mice model of chronic lung inflammation to explore the molecular and cellular pathways triggered by long-term use of combustible cigarettes (CCs) and electronic nicotine delivery devices (ENDS). Blood gas analysis, descriptive and quantitative histology, ELISA assay, intracellular staining, and flow cytometry analysis were used to determine the differences in immune cell-driven lung inflammation between experimental (CC and ENDS-exposed) and control (Air-exposed) mice. Continuous exposure to either CCs or ENDS caused a significant systemic inflammatory response, increased NLRP3 inflammasome activation in neutrophils and macrophages, and heightened dendritic cell-dependent activation of Th1 and Th17 cells in the lungs. The immunological response induced by ENDS was less strong than the inflammatory response elicited by CCs, resulting in less severe lung damage and inflammation. In ENDS-exposed animals, serum inflammatory cytokine concentrations were considerably reduced. ENDS recruited fewer circulating leukocytes in wounded lungs than CCs and were less capable of inducing CD14/TLR-2-dependent activation of the NLRP3 inflammasome in lung-infiltrated neutrophils and macrophages. Dendritic cells stimulated with ENDS demonstrated a lower potential for Th1 and Th17 cell-driven lung inflammation. Accordingly, in CCs-exposed mice, substantial immune cell-driven lung damage resulted in severe respiratory dysfunction, whereas ENDS resulted in mild respiratory dysfunction. This is the first study to examine the effects of CCs and ENDS on lung-infiltrated immune cells. Obtained results indicated that ENDS have a lower potential to induce a robust inflammatory response in the lungs than CCs.

ABSTRACT BOOK

CLINICAL ASSESSMENT AND HARM REDUCTION

THE ROLE OF HEAT-NOT-BURN, SNUS AND OTHER NICOTINE-CONTAINING PRODUCTS AS INTERVENTIONS FOR EPILEPTIC PATIENTS WHO TAKE PHENYTOIN AND SMOKE CIGARETTES

Praneet Valodia

OP 11

Praneet Valodia Consulting,
South Africa

Background: Cigarette smoke increases the metabolism of phenytoin, a widely used anti-epileptic agent, by inducing cytochrome P450 enzymes in the liver. Therefore, cigarette smoke may reduce the clinical effect of phenytoin. Switching from cigarettes to combustion-free products (e.g., heat-not-burn, snus and e-cigarettes) is likely to have an impact on phenytoin metabolism. The absence of tobacco combustion in these products reduces the production of the chemicals that induce the metabolism of phenytoin. The primary objective of this study was to determine whether combustion-free products have a role to play in epileptic patients who take phenytoin and continue to smoke cigarettes.

Material and Methods: A literature review was conducted. The potential mechanisms underlying the effects of cigarette smoke and nicotine on phenytoin metabolism and the pathways for phenytoin metabolism were evaluated to determine overlapping mechanisms/pathways.

Results: Thirty-five studies were reviewed. Cigarette smoke influenced the metabolism of phenytoin by increasing the maximum metabolism rate of phenytoin by an average of 16% in humans. Cigarette smoke is known to contain several polycyclic aromatic hydrocarbons (PAHs), which can lead to faster elimination of numerous medicines, including phenytoin. The metabolic pathways of phenytoin and nicotine do not overlap indicating that nicotine does not influence the metabolism of phenytoin. Hence, complete switching to combustion-free products may reduce the influence smoking has on phenytoin metabolism in epileptic patients who take phenytoin and smoke.

Conclusions: The literature showed that the increase in metabolic rate of phenytoin due to tobacco smoke is probably attributable to PAHs and not nicotine. The reduced levels of PAHs in combustion-free products indicate that there is a role for combustion-free products in epileptic patients who take phenytoin and smoke.

ABSTRACT BOOK

CLINICAL ASSESSMENT AND HARM REDUCTION

EXPOSITION TO CIGARETTE SMOKE CONSIDERABLY REDUCES CAPACITY OF MSC TO SUPPRESS IMMUNE CELL-DRIVEN HEPATITIS

Vladimir Markovic¹, Dragica Pavlovic¹, Dragana Papic¹, Nikolina Kastratovic¹, Milica Dimitrijevic-Stojanovic², Aleksandar Arsenijevic¹, Ana Volarevic¹, Vladimir Jakovljevic³, Vladislav Volarevic¹

OP 12

¹Center for Harm Reduction of Biological and Chemical Hazards, Faculty of Medical Sciences, University of Kragujevac, Serbia

²Department of Pathology, Faculty of Medical Sciences, University of Kragujevac, Serbia

³Department of Physiology, Faculty of Medical Sciences, University of Kragujevac, Serbia

It is uncertain if smoking has a negative impact on mesenchymal stem cell (MSC)-dependent immunosuppression in inflamed liver. We investigated the molecular processes behind cigarette smoke's deleterious effects on MSC-dependent immunomodulation using α -galactosylceramide (α -GalCer)-induced immune cell-driven liver damage, a well-established mouse model of fulminant hepatitis. MSC which were cultured in cigarette whole smoke-exposed medium (MSC^{WS-CM}) developed a pro-inflammatory phenotype, were unable to optimally produce immunosuppressive cytokines (TGF- β , HGF, IL-10, NO, KYN), and secreted significantly more inflammatory cytokines (IFN- γ , TNF- α , IL-17, IL-6) than MSC that were grown in standard, cigarette smoke-non exposed medium (MSC^{CM}). Unlike MSC^{CM}, which effectively suppressed α -GalCer-induced hepatitis, MSC^{WS-CM} did not prevent hepatocyte damage and liver inflammation. MSC^{WS-CM} demonstrated a lower ability to inhibit inflammatory, liver-infiltrated macrophages, dendritic cells (DCs), and lymphocytes. Although the livers of α -GalCer+MSC^{CM}-treated mice had a significantly lower number of IL-12-producing macrophages and DCs, TNF- α , IFN- γ or IL-17-producing CD4+ and CD8+ T lymphocytes, NK and NKT cells, this phenomenon was not observed in α -GalCer-injured mice that received MSC^{WS-CM}. MSC^{WS-CM} did not generate the same increase of anti-inflammatory IL-10-producing FoxP3+CD4+ and CD8+ T regulatory cells as MSC^{CM} and did not produce an immunosuppressive milieu in the liver. In similar manner as it was observed in mice, MSC^{WS-CM} were unable to optimally decrease production of inflammatory and hepatotoxic cytokines in activated human Th1/Th17 and NKT1/NKT17 cells, validating the idea that exposition to cigarette smoke considerably reduces capacity of MSC to suppress immune cell-driven inflammation.

ABSTRACT BOOK

CLINICAL ASSESSMENT AND HARM REDUCTION

THE PREVALENCE OF SMOKING IN THE POPULATION OF KRASNOYARSK ACCORDING TO THE DATA OF THE EPIDEMIOLOGY OF CARDIOVASCULAR DISEASES AND THEIR RISK FACTORS IN REGIONS OF RUSSIAN FEDERATION (ESSE-RF) STUDY AND POSSIBLE WAYS OF MODIFYING THIS RISK FACTOR

Anna Chernova, Svetlana Nikulina

OP 13

Krasnoyarsk State Medical
University, Krasnoyarsk, Russian
Federation

Background: According to the INTERHEART study, smoking is the second most important predictor of myocardial infarction. Smoking men between the ages of 35 and 74 live less than 17.7 years on average. Our purpose was to conduct a sub-analysis of the multi-center study of ESSE - RF in Krasnoyarsk and study the prevalence of smoking among the adult population of Krasnoyarsk, taking into account age and gender (according to prof. Shtarik S. Yu, Krasnoyarsk).

Material and Methods: In 4 polyclinics in the city of Krasnoyarsk, 1,123 patients aged 25 to 64 were examined. The material was collected as part of the multi-center observational study "ESSAY RF-2012". Persons were considered smokers if they smoked at least one cigarette per day. According to the patient, the smoking status ("smokes now", "quit smoking", "smokes") and the intensity of smoking were determined: low - up to 10 cigarettes per day, moderate - 10-20 cigarettes per day, high - more than 20 cigarettes per day.

Results: All 1,123 patients gave information about their attitude to the bad habit: 54.8% never smoked (28.9% of men and 69.6% of women, $p=0.000$), 21.3% quit smoking (31.8% of men and 15.4% of women, $p=0.000$) and 23.9% were smokers at the time of examination. Among men, smoking rates were significantly higher than among women (39.4% vs 15.0%, $p=0.000$). The median age of male smoking onset was 17 (14; 19) years old, while median age of smoking onset for women was 18 (16; 20) years, that is, men used to join a bad habit ($p=0.000$ according to the Mann-Whitney criterion). On average, male smokers smoked 2 times more cigarettes compared to female smokers (16 (10; 20) vs 8 (4; 15), $p=0.000$ according to Mann-Whitney criterion). 84.5% of men and 70.8% of women ($p=0.000$) used tobacco products daily.

Conclusions: The prevalence of smoking among the adult population of Krasnoyarsk is 23.9%. Among men, smoking rates are higher than among women (39.4% vs 15.0%). The identified patterns actualize the need to introduce deeper measures aimed at preventing smoking in Krasnoyarsk. An alternative is to modify this risk factor and use electronic tobacco heating systems (manufactured by Philip Morris) to reduce the content of harmful substances and carcinogens.

ABSTRACT BOOK

CLINICAL ASSESSMENT AND HARM REDUCTION

EMISSIONS, PUFFING TOPOGRAPHY, MOUTH LEVEL EXPOSURE AND CONSUMPTION AMONG JAPANESE USERS OF TOBACCO HEATED PRODUCTS

Lauren Edward, Krishna Prasad, Adam Grey, Carol Goss

OP 14

British American Tobacco Co Ltd
(BAT), UK

Background: Tobacco heating products (THPs), which heat rather than burn tobacco, have been demonstrated by a number of studies to produce an aerosol with substantially lower levels of toxicants and reduced cytotoxicity relative to cigarette smoke. As they evolve in design and function, however, it is important to verify that variant THPs maintain sufficient equivalence to the original product if we are to leverage existing foundational datasets. Recent studies suggest that a bridging approach, in which a variant is shown to be comparable to the original product on which a large foundational dataset has been generated, might be used to ensure that the same product-related claims apply.

Material and Methods: In this study, emissions and consumer behaviour were assessed for two variants of glo™ THPs: an extensively tested glo™ type 1 (glo 2.0), and glo™ type 3 (glo hyper) in base and boost modes. Emissions testing was conducted by measuring the percentage reduction of TobReg9 toxicants, relative to a 1R6F reference cigarette.

Results: Consumer behaviour, including puffing topography, average daily consumption (ADC) and mouth level exposure (MLE) to NFDPM and nicotine, was measured among 63 regular glo™ users in Tokyo, Japan. Emissions testing showed a substantial reduction in TobReg9 toxicants compared to the reference cigarette (95.5-97.3%), whilst there were no substantial differences in the ADC, puffing behaviour or MLE among the three THPs.

Conclusions: Emissions analysis based on TobReg9 toxicants and consumer behaviour data provide evidence that the glo™ type 3 is comparable to glo™ type 1, indicating the possibility of using a bridging approach for the analysis of variant THPs based on use behaviour alone.

ABSTRACT BOOK

CLINICAL ASSESSMENT AND HARM REDUCTION

EMERGING TRENDS IN TOBACCO USE DISORDER - A FOCUS ON PHARMACISTS

Todderick Prochnau

OP 15

**Todderick B. Prochnau Pharmacy
LTD, Alberta, Canada**

Pharmacists are the most accessible health professionals in Canada. Although Canadian pharmacists frequently provide smoking cessation support, they have historically had little ability to assist patients who are unable or unwilling to quit smoking. In recent years Reduced Risk Products (RRPs) have emerged as an option for patients who continue to use tobacco or nicotine. Most health professionals in Canada, including pharmacists, have little knowledge on RRP. Improving knowledge of RRP would allow pharmacists to incorporate tobacco harm reduction when working with patients who smoke but are unable or unwilling to quit.

In February 2022, The Centre for Addiction and Mental Health (CAMH) published the first ever Canadian guidelines on RRP. The Lower-Risk Nicotine Use Guidelines (LRNUG) are intended to guide health professionals and patients on how to lower the risk associated with various nicotine products. The products included in these guidelines were e-cigarettes (vapes), heated tobacco products and smokeless tobacco.

To improve pharmacist knowledge of RRP and the LRNUG, a 1.25 hour professional development (PD) program was developed titled "Emerging Trends in Tobacco Use Disorder". This program was granted national accreditation in June 2022 after peer review by 2 independent pharmacists.

This PD program reviews smoking prevalence, smoking harms, pharmacology of nicotine, clinical assessment of tobacco use status and pharmacotherapy for smoking cessation. This program also reviews RRP including associated harms and risk compared to conventional cigarettes. Finally, the program introduces how RRP can be incorporated into clinical practice to ensure patient-centred care.

As of June 2023, this program has been presented to over 1,000 pharmacists in Canada. The program evaluations are consistently positive with 92.7% of participants reporting "The information presented in this course will be helpful in my pharmacy practice."

ABSTRACT BOOK

EPIDEMIOLOGY & SOCIAL ISSUES

BASELINE RESULTS OF A CONSUMER USE AND BEHAVIOUR PATTERNS STUDY ON ORAL NICOTINE POUCHES IN SWEDEN, DENMARK, SWITZERLAND AND THE UNITED KINGDOM

Mandara Shetty¹, Krishna Prasad¹, Daniel Jelstrup², Bo Elvers², David Azzopardi¹, Tasheen Jilani¹, Claudia Kanitscheider³

OP 16

¹British American Tobacco (BAT), UK

²Kantar Denmark

³Cerner Enviza

Oral nicotine pouches (ONPs) may offer lower risks compared with combustible tobacco products. ONPs are placed between the lip and gum for 5-30 min to allow nicotine absorption via the oral mucosa. There is limited information on ONP use in a real-world setting or product use trajectories over time, due to the novel nature of these products and their low usage prevalence since market introduction.

An online survey was implemented in four countries (Sweden, Denmark, Switzerland and the UK) with strong focus on ONP usage behaviour patterns, mouth hold times, as well as past and concurrent tobacco and nicotine product (TNP) consumption. Changes in TNP use since starting ONP use and comparative risk perception were also collected. A 6 month follow up survey is planned to observe product use trajectories. 2,133 participants completed the questionnaire on the following key parameters: ONP frequency and pattern of use, flavour and nicotine strength preferences and comparative risk perceptions among various TNPs.

The majority of participants reported using ONP daily and started use, on average, 3 years prior to the study and in Sweden, up to 5 years prior. Average daily consumption for daily users was five pouches per day in the UK, seven in Switzerland, eight in Denmark, and 10 in Sweden. Non-daily users averaged roughly one pouch per day in the UK, one to two pouches in Switzerland and Denmark, and two to three pouches in Sweden. Mouth hold time was mostly between five and less than 30 minutes except in Sweden, where it was up to one hour. The most common product nicotine levels were between 6 to 15 mg, and use of products with levels higher than 20 mg was rare. Additionally, flavour preferences, main reasons for use and risk perceptions of ONPs and other TNPs were measured.

ABSTRACT BOOK

EPIDEMIOLOGY & SOCIAL ISSUES

THE RELATIONSHIP BETWEEN SALES OF SMOKED AND SMOKE-FREE TOBACCO PRODUCTS IN THE CZECH REPUBLIC, GREECE, HUNGARY, ITALY, JAPAN, KOREA, LITHUANIA, PORTUGAL, SLOVAKIA, NORWAY, AND SWEDEN

Pierre Belamri, **Ondrej Koumal**

OP 17

Philip Morris International

Background: Several studies have provided evidence that electronic cigarettes (e-cigarettes) serve as a general substitute for cigarettes. This substitution influences the overall public health consequences of regulation and taxation because policies for smoke-free tobacco and nicotine products (e.g., e-cigarettes, heated tobacco, nicotine pouches, and snus) should be assessed in the context of their impact on the demand for more harmful smoked tobacco products, primarily cigarettes.

Material and Methods: The present work focused on smoke-free products other than e-cigarettes. The national sales volume estimates were obtained from Philip Morris International's investor communication disclosures and other publicly available sources. We calculated Pearson correlation coefficients (r) to examine the relationships between sales of smoked tobacco products (primarily cigarettes) and sales of heated tobacco product consumables in nine countries (the Czech Republic, Greece, Hungary, Italy, Japan, Korea, Lithuania, Portugal, Slovakia) where heated tobacco products reached a 15% share of the total tobacco market in 2022. The same approach was used to examine snus sales in Norway and Sweden. The r values reflect the strength and direction of the correlation between the two product categories' sales volumes.

Results: The strongest negative correlation between cigarettes and smoke-free tobacco product sales was found in Japan ($r = -0.987$, p -value < 0.001), indicating that cigarette sales decrease as smoke-free product sales increase. The results for the other countries also showed strong negative correlations.

Using real-life examples, we also examined limitations and confounders that can impact observed correlations, including seasonality, cross-border sales, and illicit trade.

Conclusions: Despite limitations, the results indicate that heated tobacco products and snus are competing against cigarettes. Future research needs to account for the confounding and other factors and to be triangulated with population data that can provide information on the prevalence of use of different product categories and product use trajectories.

ABSTRACT BOOK

EPIDEMIOLOGY & SOCIAL ISSUES

CROSS-SECTIONAL ONLINE SURVEY TO DETERMINE THE KNOWLEDGE, ATTITUDE AND PRACTICE THE PARTICIPATION OF TOBACCO CESSATION AMONG HEALTHCARE WORKERS IN RUSSIA

Artur Tuktarov, Aleksandr Filippov, Andrey Obrezan

OP 18

Saint Petersburg State University,
Saint Petersburg, Russian
Federation

Background: Smoking is a major modifiable risk factor for cardiovascular disease. Quitting smoking is the most cost-effective strategy to prevent CVD. One effective approach of tobacco control is the participation of healthcare workers in the prevention efforts against tobacco use. This study aimed to determine healthcare workers' knowledge, attitude, and practice the participation of tobacco cessation.

Material and Methods: A cross-sectional survey study was conducted among healthcare workers working in Russia using a self-administered online questionnaire in 2022. Participants were healthcare workers aged 18 years and above (n=965) from 8 regions of Russia.

Results: There were 57 specialties, of which 28.6% (n=276) and 20.9% (n=202) were internists and cardiologists, respectively. 79% of healthcare workers (n=765) ask about smoking history, regardless of whether there is a smoking-related illness. Eighty-nine percent of physicians (n=857) believe that smoking cessation advice given by a healthcare professional improves a patient's chances of quitting smoking. Only 28% (n=272) of doctors were aware the principle of the difference between electronic cigarettes and traditional cigarettes. 75% (n=728) of respondents agreed with the statement "The greatest harm caused by tobacco smoking is due to its combustion products". However, only 28% (n=272) physicians had the knowledge of difference of using non-combustible tobacco product and traditional cigarettes.

Conclusions: Much of the medical community is unaware of how e-cigarettes and tobacco heating systems work and how they differ from traditional cigarettes. The medical community needs to be educated about the concept of harm reduction and the difference between smokeless products and cigarettes. It is expedient to introduce sections on THR in physician education programs or clinical guidelines. This strategy would help adult smokers who are not motivated to quit to get qualified advice from a physician not only from a complete quit, but also from a harm reduction perspective.

ABSTRACT BOOK

EPIDEMIOLOGY & SOCIAL ISSUES

PREVALENCE OF TOBACCO AND NICOTINE USE IN THE ADULT GREEK POPULATION: RESULTS FROM REPEATED CROSS-SECTIONAL SURVEYS (2022-2023)

Vasiliki Engeli, Angelos Hatzakis, Vana Sypsa

OP 19

Department of Hygiene,
Epidemiology and Medical
Statistics, Medical School,
National and Kapodistrian
University of Athens, Greece

Background: Monitoring trends in the use of combustible and non-combustible nicotine products is crucial to implement tobacco/nicotine control policies and assess their effectiveness. We aimed to estimate the trends in tobacco/nicotine use and evaluate the perceptions concerning non-combustible alternatives in the adult Greek population over the period 2022-2023.

Material and Methods: Two cross-sectional surveys were conducted throughout Greece (June 2022, N=2,004 and May 2023, N=1,999). Random digit dialling and proportional quota sampling was used to recruit participants. The estimates were adjusted for the age-sex-NUTS I distribution of the population. Smokers, users of electronic cigarettes (ECs) and users of heated tobacco products (HTPs) were defined as those who had smoked at least 100 cigarettes, used ECs at least 100 times and used at least 100 sticks in their lifetime, respectively. Current use was defined as use in the past 30 days. Comparisons by period were performed using the Chi-squared test.

Results: Compared to 2022, in 2023 the prevalence of current use of any tobacco/nicotine product remained relatively stable (34.4% vs. 32.7%, respectively), with a decrease in boxed/hand-rolled cigarettes (29.5% vs. 24.8%, $p=0.003$), stable levels of ECs (3.8% vs. 4.6%, $p=0.268$) and an increase in HTPs (4.3% vs. 6.4%, $p=0.008$). The prevalence of exclusive use was 24.7% vs. 19.5% for boxed/hand-rolled cigarettes ($p<0.001$), 1.8% vs. 2.2% for ECs ($p=0.434$) and 2.4% vs. 4.3% ($p=0.002$) for HTPs in 2022 and 2023, respectively. Out of those aware of non-combustible alternatives in the two surveys, 3 and 4 out of ten believed that the use of ECs and HTPs, respectively, is less harmful than cigarettes.

Conclusions: There were decreasing trends in the prevalence of current cigarette smoking and increases in the current use of HTPs over 2022-2023. The proportion of current and exclusive users of alternative products is small yet growing.

ABSTRACT BOOK

EPIDEMIOLOGY & SOCIAL ISSUES

PREVALENCE AND INITIATION PATTERNS OF COMBUSTIBLE TOBACCO PRODUCTS AND NON-COMBUSTIBLE ALTERNATIVES AMONG YOUNG ADULTS IN GREECE, MAY-JUNE 2023

Vasiliki Engeli, Angelos Hatzakis, Vana Sypsa

OP 20

Department of Hygiene,
Epidemiology and Medical
Statistics, Medical School,
National and Kapodistrian
University of Athens, Greece

Background: Monitoring the patterns of combustible tobacco products and non-combustible alternatives among young individuals is an important indicator to measure the success of the Global Strategy for tobacco control. We aim to provide estimates of the prevalence and initiation patterns of combustible tobacco products and non-combustible alternatives [electronic cigarettes (ECs) and heated tobacco products (HTPs)] among young adults in Greece in 2023.

Material and Methods: We collected data for adults 18-24 years old from two cross-sectional telephone surveys conducted throughout Greece in May-June 2023 ($N_{\text{overall}}=612$). Random digit dialing and proportional quota sampling were used to recruit participants. The estimates were adjusted for the age-sex-NUTS I distribution of the young adult population. Smokers, users of ECs and users of HTPs were defined as those who had smoked at least 100 cigarettes, used ECs at least 100 times and used at least 100 sticks in their lifetime, respectively. Current use was defined as use in the past 30 days.

Results: The prevalence of current use of any product was 40% (boxed/hand-rolled cigarettes: 27.3%, ECs: 9.9%, HTPs: 13.4%). Among current users of boxed/hand-rolled cigarettes, ECs and HTPs, 63.3%, 42.0% and 54.3% were exclusive users, respectively. In the total sample of young adults, boxed/hand-rolled cigarettes were the first product tried by 55.9% at a median age of 16 years, ECs by 8.8% (median age: 17 years) and HTPs by 1.4% (median age: 18 years) (among ever users: 81.1% boxed/hand-rolled cigarettes, 12.7% ECs, 2% HTPs).

Conclusions: In 2023, four out of ten young adults report current use of any product and one fourth report non-combustible alternatives. Non-combustible alternatives were reported as the first product tried by a small proportion of ever users.

ABSTRACT BOOK

BIOMARKERS' EVALUATION IN ANIMAL OR HUMAN STUDIES

THE BIOMARKERS OF EXPOSURE LEVELS AFTER SWITCHING FROM CONVENTIONAL CIGARETTES TO TOBACCO HEATING SYSTEM

Sayar R. Abdulkhakov, Rashat I. Faizullin, Tatyana V. Grigoryeva, Leonid V. Lopukhov, Andrey P. Kiassov

OP 21

Kazan Federal University, Kazan,
Russian Federation

Background: The primary objective was to assess the levels of biomarkers of exposure in smokers transitioning from conventional cigarettes (CC) to tobacco heating system (THS) in comparison to continuing smoking CC and smoking abstinence.

Material and Methods: Sixty volunteers (adult smokers, m-48, f-12; age 21 to 69) were randomized to 3 groups (THS; conventional cigarettes, CC; smoking abstinence, SA). The duration of the study was 5 days. Levels of nicotine, nicotine glucuronides and their derivatives, and mercapturic acids were detected in 24-hour urine; levels of nicotine derivatives and carboxyhemoglobin were measured in blood.

Results: No adverse events were registered during the study. On Day 5 blood carboxyhemoglobin levels in CC group were significantly higher than in THS ($p=0.037$) and SA ($p=0.003$) groups whereas no significant difference was observed between THS and SA groups ($p=0.531$). On Day 0 volunteers of all 3 groups (CC, THS, SA) were comparable in terms of nicotine metabolites concentration in daily urine. Levels of nicotine and metabolites (cotinine, nornicotine, trans-3-hydroxycotinine), nicotine glucuronides and cotinine, nitrosornicotine, 4-methylnitrosamino-1-3-pyridyl-1-butanol, and anabasine in urine didn't differ statistically in CC group on Day 0 and Day 5. Switching from CC to THS leads to significant decrease in several metabolites while still sustaining consistent nicotine level by Day 5: 1) Concentration of urine mercapturic acids in THS and SA groups significantly decreased by Day 5 ($p<0.001$ for 2-cyanoethylmercapturic acid, S-(3-hydroxypropyl) mercapturic acid, 3-hydroxy-1-methylpropyl-mercapturic acid (HMPMA), S-phenylmercapturic acid; $p=0.001$ for monohydroxybutenyl-mercapturic acid. 2) No difference was found in mercapturic acids levels between THS and SA groups on Day 5 ($p>0.05$), with the exception for HMPMA ($p=0.045$). 3) Levels of all measured mercapturic acids in THS group were significantly lower on Day 5 comparing with CC group ($p<0.001$).

Conclusions: Our results of the 5-day study demonstrate the significant decrease of bioexposure markers concentrations almost to the level of smoking abstinence when switching from CC to THS.

ABSTRACT BOOK

BIOMARKERS' EVALUATION IN ANIMAL OR HUMAN STUDIES

BIOMARKERS OF EXPOSURE AND POTENTIAL HARM IN EXCLUSIVE USERS OF ELECTRONIC CIGARETTES AND CURRENT, FORMER AND NEVER SMOKERS

Linsey E. Haswell, Nathan Gale, Elaine Brown, David Azzopardi, Michael McEwan, Filimon Meichanetzidis, Senthil Vel

OP 22

R&D Centre, B.A.T. (Investments)
Limited, Southampton, UK

International Standard
Registered Clinical Trial number:
ISRCTN58921739

Background: Electronic cigarette (EC) aerosol emissions generally contain fewer and lower concentrations of harmful and potentially harmful constituents, compared with cigarette smoke. Further studies are needed to establish whether decreased emissions translate to reduced health risks for EC users.

Material and Methods: In a cross-sectional study, biomarkers of exposure (BoE) to certain tobacco smoke toxicants and biomarkers of potential harm (BoPH), associated with biological processes linked to the potential development of smoking-related diseases and oxidative stress, were assessed in solus Vuse ECs users and current, former, and never smokers. In total, 213 participants were enrolled, and smoking status was confirmed by urinary cotinine, exhaled carbon monoxide, and N-(2-cyanoethyl)valine levels (EC users and former smokers only). During confinement participants used their usual product (EC or cigarette) as normal and BoE and BoPHs were assessed via blood, 24-h urine, and physiological assessment.

Results: Significantly lower levels of all urinary BoE; MHBMA, HMPMA, 3-HPMA, NNN, 3-OH-B[a]P, S-PMA, NNAL (all $p < 0.0001$), and TNeq ($p = 0.0074$) were observed in EC users when compared with smokers. Moreover, significantly lower levels were observed in EC users for 3 of the 7 BoPH measured, carboxyhaemoglobin ($p < 0.0001$), soluble intercellular adhesion molecule-1 ($p = 0.0028$), and 11-dehydrothromboxane B2 ($p = 0.0012$), when compared with smokers.

Conclusions: As compared with smokers, solus Vuse EC users have significantly lower exposure to tobacco toxicants for the BoE, and 3 BoPH measured. These results add to the weight of evidence supporting EC as part of a tobacco harm reduction strategy.

ABSTRACT BOOK

BIOMARKERS' EVALUATION IN ANIMAL OR HUMAN STUDIES

BIOMARKERS OF EXPOSURE AND POTENTIAL HARM IN EXCLUSIVE USERS OF NICOTINE POUCHES AND CURRENT, FORMER AND NEVER SMOKERS

Michael McEwan, David Azzopardi, Linsey E. Haswell, Justin Frosina, Nathan Gale, Filimon Meichanetzidis, Senthil Vel

OP 23

R&D Centre, B.A.T. (Investments)
Limited, Southampton, UK

International Standard
Registered Clinical Trial number:
ISRCTN16988167

Background: Oral nicotine pouches (NPs) are smokeless, tobacco-free products that have a potential role in tobacco harm reduction strategies.

Material and Methods: This was a cross-sectional study where biomarkers of exposure (BoE) to tobacco/tobacco smoke toxicants and several recognised biomarkers of potential harm (BoPH) linked to smoking-related diseases were compared among exclusive adult users of Velo NPs and current/former/never smokers in Sweden/Denmark. In clinic over 24 hours, participants used their usual product (Velo NP or cigarette) as normal, and BoE/BoPH were assessed via blood/24-h urine/exhaled breath/physiological assessments.

Results: Among the primary endpoints, total NNAL (16.9 ± 29.47 vs 187.4 ± 228.93 pg/24 h), white blood cell count (5.59 ± 1.223 vs $6.90 \pm 1.758 \times 10^9/L$), and COHb (4.36 ± 0.525 vs $8.03 \pm 2.173\%$ saturation) were significantly lower among Velo users than among smokers (91%, 19% and 46% lower, respectively, all $P < 0.0001$), while fractional exhaled NO, previously shown to be lower in smokers, was significantly higher (23.18 ± 17.909 vs 11.20 ± 6.980 ppb) among Velo users (107% higher, $P < 0.0001$). Furthermore, sICAM-1 tended to be lower (185.9 ± 42.88 vs 204.5 ± 64.85 ng/mL) among Velo users than smokers (9% lower). Several secondary endpoints, including six BoEs (3-HPMA (246.7 ± 91.07 vs 1165.7 ± 718.35 $\mu\text{g}/24$ h), 3-OH-B[a]P (82.4 ± 217.58 vs 258.3 ± 190.20 pg/24 h), HMPMA (135.1 ± 77.85 vs 368.8 ± 183.15 $\mu\text{g}/24$ h), MHBMA (0.22 ± 0.166 vs 3.39 ± 2.943 $\mu\text{g}/24$ h), S-PMA (0.10 ± 0.059 vs 3.53 ± 2.736 $\mu\text{g}/24$ h) and total NNN (7.5 ± 24.84 vs 9.7 ± 5.93 ng/24 h)), were significantly lower among Velo users (78.8%, 68.1%, 63.4%, 93.5%, 97.2% and 22.7% lower, respectively, $P < 0.0001$ – 0.0011), while total nicotine equivalents was significantly higher among Velo users (22.6 ± 12.69 vs 12.1 ± 7.92 mg/24 h, $P < 0.0001$), although Velo user levels are comparable to those previously reported among oral tobacco users, and Velo user and smoker mean levels were similar in Denmark.

Conclusions: With exclusive use of Velo NPs participants have significantly less exposure to tobacco toxicants and more favourable BoPH associated with initiating biological processes of smoking-related diseases compared to users of combustible cigarettes.

ABSTRACT BOOK

BIOMARKERS' EVALUATION IN ANIMAL OR HUMAN STUDIES

DISTRIBUTION OF DOPAMINE PATHWAY GENE POLYMORPHISMS IN SUBJECTS WITH DIFFERENT SMOKING BEHAVIOR

Evgeny N. Imyanitov^{1,2}, Natalia V. Mitiushkina^{1,2}, Olga A. Sukhovskaya^{3,4}

OP 24

¹N.N. Petrov Institute of Oncology, Saint Petersburg, Russian Federation

²St. Petersburg Pediatric Medical University, Saint Petersburg, Russian Federation

³Institute of Pulmonology, Saint Petersburg, Russian Federation

⁴Institute of Phthisiopulmonology, Saint Petersburg, Russian Federation

Acknowledgments:

This work has been supported by the Russian Science Foundation (grant 23-45-10038).

Background: Multiple lines of evidence support the role of genetic constitution in the initiation, persistence, intensity and success in cessation of tobacco smoking. Switching to less harmful tools for nicotine delivery may serve as a balanced strategy to reduce the health risks for severe tobacco addicts.

Material and Methods: The study included 1230 subjects (570 current smokers; 246 former smokers; 267 non-smokers, who tried cigarettes at least ones but did not become a smoker; and 147 never-smokers, who did not even attempt to taste tobacco products). The group of former smokers included 54 subjects, whose cessation interval was lower than 6 months; these cases were excluded when comparing former smokers against current smokers. Twenty gene polymorphisms, which belong to the dopamine pathway and demonstrated evidence for functional role in *in vitro* or *in vivo* studies, have been selected for investigation and analyzed in the above groups.

Results: Three groups of comparisons were performed. First, we compared never-smokers, i.e. people who never even attempted to smoke, against the rest of the study. This comparison aimed to reveal whether variations in dopamine pathway genes are involved in the interest to smoking. Secondly, we compared non-smokers versus habitual (former and current) smokers. This comparison addressed the question whether some of the studied genes influence the transition from occasional to habitual smoking. Thirdly, we analyzed genotypes of former smokers with cessation period exceeding 6 months in comparison with current smokers. If p value is 0.05, 3 out of total 60 comparisons will pass this threshold solely due to a chance. In fact, there were 13 comparisons with $p < 0.05$, which indicates that at least some of the observed associations are indeed relevant to smoking behavior. There were statistically significant differences between never- versus ever-smokers ($p = 0.021$) and between non-smokers versus habitual former or current smokers ($p = 0.029$). In contrast,

the difference between former and current smokers did not reach statistical significance. Two gene polymorphisms showed consistent associations across all three comparisons, i.e., DAT1 40-bp repeat and MAOA 30-nucleotide repeat.

Conclusions: This study confirms that genetic constitution influences the interest to smoking initiation as well as the transition from occasional to habitual smoking. Subjects with unfavorable genotypes may constitute an especial group of people requiring personalized strategies for smoking harm reduction. The analysis of dopamine pathway polymorphisms deserves to be extended to subjects with modern smoking attitudes, e.g., to the current and former users of electronic nicotine delivery systems.

ABSTRACT BOOK

BIOMARKERS' EVALUATION IN ANIMAL OR HUMAN STUDIES

ANALYSIS OF BIOMARKERS OF EXPOSURE WHEN USING CIGARETTES AND ELECTRONIC TOBACCO HEATING SYSTEMS

Anna Chernova, Svetlana Nikulina

OP 25

Krasnoyarsk State Medical
University, Krasnoyarsk, Russian
Federation

Background: Cigarette smoke contains nicotine (a natural component of tobacco) and a variety of harmful chemicals. It is these toxins, not nicotine, that are the leading cause of smoking-related diseases. The risk reduction is due to the use of products that will become an alternative to traditional cigarettes. These products contain nicotine, have a rich taste and give the aroma familiar to smokers, but do not produce smoke. The purpose of this study was to analyze biomarkers of exposure when using cigarettes and electronic tobacco heating systems.

Material and Methods: Analysis of literature data (Japanese study) on biomarkers of clinical risk of cardiovascular disease in cigarette smoking and use of electronic tobacco heating systems.

Results: Exposure biomarkers indicate exposure to a potentially hazardous substance. The biomarker may be a substance included in cigarette smoke or a metabolite measured in a biological fluid or tissue. From biomarkers of exposure, the amount of substance absorbed by the body can be determined.

- Carboxyhaemoglobin - indicates exposure to carbon monoxide (CO).
- Total NNAL - tobacco nitrosamines have carcinogenic properties, makes a significant contribution to the etiology of lung and pancreatic cancers.
- MHBMA (monohydroxybutenyl mercapturic acid) – 1,3-butadiene biomarker, carcinogen, causes central nervous system damage and impaired embryonic development.
- 3-HPMA (3-hydroxypropylmercapturic acid) – an acrolein biomarker, an irritating effect on the eyes, skin, and airways. Carcinogen, can cause asthma, cystitis.
- S-PMA (S-phenylmercapturic acid) – a biomarker of benzene, toxic effect - causes acute and chronic poisoning. It has irritating, immunotoxic allergic effects, mutagenic activity. Carcinogen, can cause leukemia.

Conclusions: The 5-day and 90-day clinical studies measured biomarkers in blood and urine signaling exposure to selected harmful and potentially harmful substances.

Levels of 15 biomarkers of exposure in the group switching completely to using electronic tobacco heating systems were comparable to those who quit smoking during the study.

In both cases, levels remained significantly lower than those of subjects who continued smoking during the study. A complete switch to electronic tobacco heating systems is less harmful than continuing to smoke cigarettes.

ABSTRACT BOOK

BIOMARKERS' EVALUATION IN ANIMAL OR HUMAN STUDIES

ANALYSIS OF CLINICAL RISK MARKERS FOR CARDIOVASCULAR AND BRONCHOPULMONARY DISEASES USING CIGARETTES AND ELECTRONIC TOBACCO HEATING SYSTEMS

Anna Chernova, Svetlana Nikulina

OP 26

Krasnoyarsk State Medical
University, Krasnoyarsk, Russian
Federation

Background: There is no harmless form or dose of tobacco. The smoke of one cigarette contains, according to various sources, from 4,000 to more than 7,000 chemicals, including 69 proven carcinogens and 250 components with cytotoxic effects. Tobacco contains nicotine, which is a highly addictive psychoactive substance. The purpose of the study was to analyze literature data on clinical risk markers (based on a randomized US trial) when using cigarettes and electronic tobacco heating systems.

Material and Methods: Literature data: Effects of Switching to a Heat-Not-Burn Tobacco Product on Biologically Relevant Biomarkers to Assess a Candidate Modified Risk Tobacco Product: A Randomized Trial.

Results: Clinical risk markers represent a measurable change in biochemical, physiological (organs, tissues, cells) or behavioral function of the body, indicating a deterioration in health or the presence of disease. Participants were randomized to a group continuing smoking (n=496) or a group switching to using electronic tobacco heating systems (n=488) for 6 months.

- Total NNAL - genotoxicity, tumor development.
- 8-epi PGF 2a - oxidative stress, cardiovascular system disease, COPD, cancer.
- WBC - inflammation, cardiovascular system disease, COPD, cancer.
- FEV1% - respiratory impairment, COPD.
- COHb - acute exposure, cardiovascular system.
- sICAM-1 - endothelial dysfunction, cardiovascular system.
- 11-DTX-B - thrombus formation, cardiovascular system.
- HDL-C - lipid metabolism, cardiovascular system.

The main outcome was a favorable change at 6 months with statistically significant improvements in 5 out of 8 biomarkers of

exposure (HDL-C, WBC, FEV1% pre, COHb, total NNAL), in the group switching to electronic tobacco heating systems compared to those continuing to smoke cigarettes.

Conclusions: When using electronic tobacco heating systems, the tobacco is heated, not burned. As a result, the formation of harmful and potentially harmful substances is significantly reduced. Scientific studies have shown that the complete transition from cigarette smoking to the use of electronic tobacco heating systems significantly reduces the impact of harmful and potentially harmful substances on the human body.

ABSTRACT BOOK

BIOMARKERS' EVALUATION IN ANIMAL OR HUMAN STUDIES

REDUCTION OF AMMONIA EMANATING FROM HUMAN SKIN SURFACE WITH THE USE OF HEATED TOBACCO PRODUCTS

Yoshika Sekine, Masaki Kawaguchi

OP 27

School of Science, Tokai
University, Japan

Human body odour comprises volatile compounds emanating from the skin surface, which are known as human skin gases. The body odour is usually recognised as a matter of comfort or discomfort for the surrounding people, whilst human skin gases have been attracting considerable attentions as a non-invasive biomarker for individual health status. Our previous study showed cigarette smoking significantly altered the skin gas composition by releasing inhaled volatile chemicals through the skin surface. To date, however, effects of heated tobacco products use have not been reported on the skin gas composition. Ammonia is a typical skin gas with pungent odour. The skin ammonia is a possible biomarker reflecting autonomic nervous system because the dermal emission tends to increase due to physical and/or psychological stress. Heated tobacco product is a delivery system of nicotine which can relax muscles and decrease psychological stress of users. This study aimed to investigate the effect of heated tobacco products use on the cutaneous ammonia emission. The skin ammonia was collected by a passive flux sampler at the forearm of current users (#1 and #2) for 1 hour before and after the use of IQOS ILUMA. After sampling, the emission flux of ammonia was determined by ion chromatography. As for #1, the emission flux before use resulted in $307 \text{ ng cm}^{-2} \text{ h}^{-1}$ ($n=2$) which can contribute to his/her body odour. However, the level remarkably decreased to $212 \text{ ng cm}^{-2} \text{ h}^{-1}$ immediately after use and to $74 \text{ ng cm}^{-2} \text{ h}^{-1}$ after 1 hour of the use. Similar tendency was also found for #2. Even though ammonia is present in aerosols, the results suggested no additive effect of inhaled ammonia on the emission level. Rather, the use of the device has reduced the stress of users and improved the body odour caused by ammonia.

ABSTRACT BOOK

TOXICOLOGY AND AEROSOL CHEMISTRY

THE IMPACT OF E-CIGARETTE FLAVOURINGS AND NICOTINE STRENGTH ON *IN VITRO* LUNG TOXICITY USING 3D RECONSTITUTED AIRWAY EPITHELIUM

Emma Bishop, Nicole East, Fabio Miazzi, **David Smart**, Stacy Fiebelkorn, Marianna Gaca, Damien Breheny, David Thorne

OP 28

B.A.T. (Investments) Limited,
Southampton, UK

Vaping has the potential to reduce the individual health risks associated with smoking and e cigarette flavours have been reported to help smokers' transition from cigarettes. Here, we provide evidence to support the reduced risk potential of e-cigarette aerosols and flavours by assessing commercially available e-liquids (Vuse ePod) in a 2D *in vitro* screening approach. We also analysed selected flavours using a more physiologically relevant 3D (MucilAir) whole aerosol exposure model, measuring toxicity and functional endpoints such as Trans Epithelial Electrical Resistance (TEER), Cilia Beat Frequency and Active Area. To contextualise responses, we have compared e-cigarette aerosol to cigarette smoke (1R6F research cigarette) and calculated the percentage reduction using a point of departure approach. We show that aerosolised flavoured e-liquids, (appropriately stewarded) do not increase the overall measured aerosol toxicity when compared to cigarette smoke. In fact, we demonstrate that the measured *in vitro* cellular toxicity of flavoured e-cigarette products remains >95% reduced when compared to cigarette smoke toxicity, using point of departure (IC80) approach. Furthermore, we tested the e-liquid flavour with the highest response in the initial screening phase in a range of commercially available nicotine strengths at the time of study conduct (0 mg/ml to 34 mg/ml). The toxicity profile of this flavoured e liquid was not altered by increasing nicotine strength and 95% reductions from 1R6F were maintained. These data indicate that the overall product toxicity is not increased in a flavour or nicotine dependent manner and that flavoured e-cigarette products can potentially play a role in tobacco harm reduction.

ABSTRACT BOOK

INNOVATION & NOVEL PRODUCTS

DIFFERENTIAL EFFECTS OF HEAT-NOT-BURN, ELECTRONIC, AND CONVENTIONAL CIGARETTES ON ENDOTHELIAL GLYCOCALYX

Ignatios Ikonomidis¹, Konstantinos Katogiannis¹, Kallirhoe Kourea¹, **Gaviella Kostelli¹**, George Pavlidis¹, John Thymis¹, Eleni Katsanaki¹, Eirini Maratou², Vaia Lambadiari²

OP 29

¹2nd Cardiology Department, Attikon University Hospital, National & Kapodistrian University of Athens, Greece

²2nd Department of Internal Medicine, Research Unit and Diabetes Centre, Attikon University Hospital, Medical School, National and Kapodistrian University of Athens, Greece

Background: The effect of heat-not-burn cigarette (HNBC) and electronic cigarette (Ecig) use on endothelial glycocalyx has not been investigated so far.

Material and Methods: 100 smokers were examined. 50 current smokers were randomized to HNBC use (n=25) or to Ecig puffing (n=25) and 50 smokers were used as controls and continued conventional tobacco smoking (Tcig) for 1 month. We measured perfused boundary region (PBR) of the sublingual arterial microvessels (increased PBR indicates reduced endothelial glycocalyx thickness), exhaled CO concentration and cotinine blood levels at baseline and after one month.

Results: Compared with baseline, switching to HNBC for 1-month improved only PBR5-25 (2.55 ± 0.49 vs 2.34 ± 0.34 μm , $p=0.002$). Puffing Ecig did not alter endothelial glycocalyx at any micro-vessel range throughout the study ($P>0.05$). Conversely, smoking Tcig for one month further deteriorated endothelial glycocalyx at all micro-vessel ranges compared with baseline ($P<0.005$). Cotinine blood levels were similar at baseline and after one month using HNBC ($P=0.432$), Ecig ($P=0.535$), or Tcig ($P=0.489$). Compared with baseline, CO concentration was decreased in HNBC and Ecig users (mean percent change: -55% and -58%, respectively $P<0.001$), while remained unchanged in Tcig smokers ($P=0.312$) at one month.

Conclusions: In this study, we observed that Tcig smokers further deteriorated endothelial glycocalyx after continuation of smoking for 1 month. Conversely, smokers switching to Ecig preserved glycocalyx integrity while those who switched to HNBC showed a modest improvement of the glycocalyx integrity in the micro-vessel ranging from 20 to 25 μm . Cotinine levels, which reflect nicotine exposure, were similar between Tcig, HNBC, and Ecig groups. Thus, impairment of endothelial glycocalyx in the Tcig group was independent from nicotine consumption and was likely related with greater exposure to toxic emissions, such as CO, after Tcig use than after switching to HNBC or Ecig.

ABSTRACT BOOK

PRECLINICAL EVALUATION

PSYCHOPHYSIOLOGY OF HARM REDUCTION: CURRENT STATE OF THE ART

Igor Pantić

OP 30

Department of Medical
Physiology, Faculty of Medicine,
University of Belgrade, Serbia

Abrupt cessation of harmful habits and addictions is associated with numerous functional changes in several brain regions. Dopamine, serotonin, glutamate, and GABA neurotransmission may be altered in numerous neural pathways, including those related to brain reward circuitry, craving, and impulse control. Various neurobiological mechanisms of emotional regulation and stress responses may also be changed in these circumstances. In contrast, the nature of these changes may significantly differ when implementing harm reduction approaches, which involve the gradual reduction of harmful behavior or substitution with less harmful behavioral patterns. Harm reduction strategies are commonly characterized by a more controlled adjustment of neurotransmitter levels, a less pronounced imbalance of receptor expression and sensitivity, as well as fewer disruptions in intracellular signaling pathways. There are various animal experimental models that may be utilized to study harm reduction in the laboratory setting. These may include zebrafish behavioral models, self-administration and conditioned place preference models in rodents, as well as various social models in non-human primates. Limitations of these models include numerous translational issues such as the inability to adequately mimic human behavior and harmful behavioral patterns in experimental conditions. Here, we discuss current knowledge and research on the psychophysiology of harm reduction with a focus on future trends in this rapidly evolving scientific area.

ABSTRACT BOOK

PRECLINICAL EVALUATION

GENOTOXICITY INDUCED BY CIGARETTE SMOKE AND MODIFIED RISK PRODUCTS (MRPs)

Konstantinos Partsinevelos¹, Rosalia Emma^{1,2}, Virginia Fuochi¹, Alfio Distefano¹, Sonja Rust³, Fahad Zadjali⁴, Mohammed Al-Tobi⁴, Antonio Giordano⁵, Ang Sun⁵, Vladislav Volarevic⁶, Konstantinos Poulas^{7,8}, Pio-Maria Furneri¹, Riccardo Polosa^{2,9}, Giovanni Li-Volti^{1,2}, Massimo Caruso^{1,2}, and the Replica Project Group*

OP 31

¹Department of Biomedical and Biotechnological Sciences, University of Catania, Italy

²Center of Excellence for the Acceleration of Harm Reduction (CoEHAR), University of Catania, Italy

³ECLAT Srl, spin-off of the University of Catania, Italy

⁴College of Medicine and Health Sciences, Department of Clinical Biochemistry, Sultan Qaboos University, Khodh, Oman

⁵Sbarro Institute for Cancer Research and Molecular Medicine, Department of Biology, College of Science and Technology, Temple University, Philadelphia, USA

⁶Center for Molecular Medicine and Stem Cell Research, Department of Microbiology and Immunology, Faculty of Medical Sciences, University of Kragujevac, Serbia

⁷Laboratory of Molecular Biology and Immunology, Department of Pharmacy, University of Patras, Greece

⁸Institute for Research and Innovation, IRIS, Patras Science Park, Patras, Greece

⁹Department of Clinical and Experimental Medicine, University of Catania, Italy

*Replica Project Group (Razan Zadjali⁴, Zaina Alharthi⁴, Roberta Pulvirenti¹, Aurora Costa⁵, Aleksandar Arsenijevic⁶, Konstantinos Mesiakaris^{7,8})

Despite decades of solid scientific information on the health risks of tobacco consumption, cigarette smoking remains a leading cause of morbidity and mortality worldwide. In recent years, modified risk products (MRPs) have revolutionized the tobacco industry gaining more and more users. The comparison between MRPs and conventional, combustion cigarettes is crucial to evaluate the potential health consequences associated with tobacco use.

In this study, which is related to CoEHAR's Replica project (Center of Excellence for the Acceleration of Harm Reduction, University of Catania), V79 lung fibroblasts of the Chinese hamster were exposed through air-liquid interface (ALI) to conventional cigarette smoke (1R6F reference cigarette, University of Kentucky) and e-cigarette aerosol (myblu, Imperial Brands) in order to compare genotoxic effects. For the exposure of V79 cells to 1R6F cigarette undiluted smoke and myblu e-cigarette undiluted aerosol were used the Borgwaldt LM1 smoking machine and the Borgwaldt LM4E vaping machine, respectively. Initially, the cytotoxicity of V79 cells exposed to 1R6F smoke (2-30 puffs under HCl regimen) was assessed by using the neutral red uptake (NRU) assay and the EC50 was established. For the evaluation of genotoxicity to 1R6F smoke (1-4 puffs under HCl regimen) and myblu aerosol (20-100 puffs under CRM81 regimen) was performed the *in vitro* micronucleus (IVM) assay. In accordance with OECD Guideline 487, the IVM assay was conducted in the presence and absence of an exogenous metabolic activation system (S9 mix, 10%). It was also examined the cytotoxic effect of S9 mix by performing a dose-response curve (1-5%).

The results revealed that 1R6F smoke is highly cytotoxic (EC50=3.149 puffs) and genotoxic. In contrast, myblu aerosol showed no evidence of genotoxicity. S9 mix induced cytotoxicity in a dose-dependent manner. In conclusion, e-cigarette aerosol resulted significantly safer compared to cigarette smoke, indicating that e-cigarettes can be beneficial in smoking harm reduction strategies.

ABSTRACT BOOK

REGULATORY ISSUES

OPTIMIZING RISK PROPORTIONATE E-CIGARETTE REGULATION; OPPORTUNITIES TO RECONCILE THR AND TOBACCO CONTROL

Samuel Hampsher-Monk

OP 32

**BOTEC Analysis, Santa Clarita,
California, USA**

E-cigarette regulation has two imperatives: Facilitate smoking cessation among those otherwise unwilling or unable to do so, and mitigate use by non-smokers (especially youth). Unfortunately, commonalities in the preferences of these groups means that policies designed to influence e-cigarettes' affordability, appeal, and acceptability in pursuit of either goal risks sacrificing the other. E-cigarettes and combustibles are economic substitutes. Thus, while taxes, minimum legal sale age restrictions and flavor bans have reduced demand for e-cigarettes, they have also increased smoking and likely deter subsequent cessation. But while the substitutability of combustibles and e-cigarettes challenges regulators, it also presents an opportunity. The dual imperatives are not entirely antithetical. Sufficiently nuanced, risk-proportionate regulation could incentivize substitutions down the risk continuum, while still discouraging experimentation by non-smokers. Appropriately enforced age-gating could also improve protections against youth access, forgoing the perceived need for the 'blunt' demand-reduction strategies which threaten e-cigarettes' suitability as cessation aids, and lead to a range of unintended consequences: increased smoking; deterred cessation; DIY after-market modifications; and illicit sales which sacrifice the advantages of regulatory oversight, surveillance, age-gating and tax-revenue generation. Sufficiently nuanced risk-proportionate regulations along with venue-based age-gating and focused & dynamic deterrence strategies to deter youth access would serve each of the 'dual' imperatives. This strategy could pay additional dividends for tobacco control: The availability of an appealing regulated and safer substitute could reduce smoker's tendency to respond to restrictions on combustibles by embracing illicit markets. That could increase the political viability, and subsequent efficacy of taxes, menthol bans, and nicotine limits applied to combustibles. Further, commercial e-cigarettes could internalize the costs of stop smoking




6th Summit Tobacco Harm Reduction

Novel products, Research & Policy

25-26 SEPTEMBER 2023 | ATHENS
ROYAL OLYMPIC HOTEL

ABSTRACT BOOK



services, allowing funds to be reallocated to other areas, including the enforcement of age-restrictions. E-cigarette regulation is a deeply polarizing topic, but there is great potential to reconcile tobacco harm-reduction with mainstream tobacco control.

ABSTRACT BOOK

REGULATORY ISSUES

NICOTINE FLUX AS A REGULATORY TARGET

Carrie Wade

OP 33

Philip Morris International

Recent technological advances have enabled the development of several novel nicotine delivery systems that deliver nicotine without combustion and help smokers move away from cigarettes. While there is a recognized need to establish regulatory standards targeting nicotine delivery to address abuse liability and toxicant exposure, the most appropriate strategy is debated. Nicotine flux was suggested as a regulatory target that considers metrics that influence nicotine emissions beyond nicotine concentration, which is the current standard in many regulatory schemes. However, both nicotine concentration and nicotine flux standards target emissions from the device rather than delivery to the users. These parameters assume a direct relationship between nicotine emission and nicotine delivery which, if incorrect, may under- or overestimate the actual nicotine delivery profile. We estimated nicotine flux from several nicotine and tobacco products including cigarettes, heated tobacco products, e-cigarettes, pouches, and several nicotine replacement therapies using definitions proposed by the Nicotine Flux Work Group to evaluate the relationship between nicotine flux and route of administration. We then evaluated the relationship between nicotine flux and nicotine delivery through various routes of administration and products using information provided from studies that provided sufficient detail to assess such a relationship. Finally, we evaluated if estimates of nicotine flux from newer tobacco products or nicotine replacement therapies predict 52-week switching or quitting success. We provide a brief perspective on the applicability of nicotine flux for human exposure and highlight the importance of considering clinical pharmacology-related paradigms when attempting to set nicotine ceilings.

6th Summit Tobacco Harm Reduction

Novel products, Research & Policy

25-26 SEPTEMBER 2023 | ATHENS
ROYAL OLYMPIC HOTEL

POSTER PRESENTATIONS

ABSTRACT BOOK

CLINICAL ASSESSMENT AND HARM REDUCTION

INTERIM RESULTS OF A 5-YEAR COHORT OBSERVATIONAL STUDY TO EVALUATE FREQUENCY OF EXACERBATIONS, RESPIRATORY SYMPTOMS, PHYSICAL EXERCISE INTOLERANCE AND ABNORMAL LUNG FUNCTIONS AMONG PARTICIPANTS WHO USE IQOS WITH HEATSTICKS COMPARED TO SMOKERS OF CONVENTIONAL CIGARETTES

Almaz Sharman, Vladimir Arnautov, Irina Yermakova, Aisulu Bekzhanova, Gulnara Tyulebekova

PP 01

Academy of Preventive Medicine
of Kazakhstan

Background: This observational cohort study aimed to investigate the long-term effects of transitioning from combustible cigarettes (CC) to heated tobacco products (HTPs) on COPD Assessment Test (CAT) scores among individuals with a history of prolonged smoking.

Material and Methods: A cohort of 1200 participants aged 40-59 years with at least 10 pack-years of smoking history was followed for 48 months. Participants were categorized into nine groups based on their HTP and CC usage levels to explore variations in health outcomes. The primary outcome measure was the change in CAT scores over the study period.

Results: Results showed that heavy CC smokers constituted 47.8% of the participants at the beginning of the study, while light CC smokers, heavy HTP smokers, and light HTP smokers accounted for 17.9%, 30.9%, and 2.1%, respectively. All HTP groups exhibited statistically significant differences compared to heavy CC smokers. The CAT score was notably lower in the group of heavy HTP smokers (-0.865 ± 0.139 , $p < 0.001$) and light HTP smokers (-1.693 ± 0.408 , $p < 0.001$) compared to heavy CC smokers. Additionally, each increase in CC or HTP use per day resulted in significant changes in CAT scores. Transitioning to HTP use was associated with a significant reduction in CAT scores compared to those who continued smoking CC after one year (-0.662 ± 0.316 , $p = 0.0361$).

Conclusions: These preliminary findings suggest that transitioning from CC to HTP use may have beneficial effects on COPD-related health outcomes. The observed improvements in CAT scores and trends indicating enhanced respiratory health and exercise tolerance support HTPs as a potential harm reduction strategy for long-term smokers. However, further investigation and long-term follow-up are necessary to validate these findings and fully ascertain the health benefits associated with HTP use as an alternative to CC.

ABSTRACT BOOK

CLINICAL ASSESSMENT AND HARM REDUCTION

AN INTEGRATED APPROACH TO THE IMPLEMENTATION OF PULMONARY REHABILITATION IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE: THE IMPORTANCE OF LIFESTYLE MODIFICATION

Tatyana Tayutina

PP 02

Federal State Budgetary
Educational Institution of Higher
Education Rostov State Medical
University of the Ministry of
Health of the Russian Federation

Background: The purpose of this study is to evaluate the effectiveness of an integrated approach to the implementation of the outpatient stage of rehabilitation with mandatory lifestyle modification in patients with COPD after outpatient treatment of an exacerbation of moderate severity.

Material and Methods: This study implemented on the basis of State Budget Institution of Rostov region of Russia "City Polyclinic №4 in Rostov-on-Don". Patients with COPD were divided into two groups: clinical observation group (n=50) using an integrated approach with mandatory lifestyle modification (smoking cessation, the use of alternative nicotine delivery methods) and the control (n=30) group, without mandatory lifestyle modification in the outpatient stage of pulmonary rehabilitation program.

Results: In the course of this study, it was revealed that the maximum level of blood oxygen saturation was achieved in the subgroup of patients who have completely given up smoking. Among the patients who used alternative nicotine delivery methods there was a tendency to increase the level of blood saturation ($p=0.061$), which once again confirms the decrease in the severity of hypoxia while minimizing exposure to tobacco smoke in patients with low motivation to quit smoking or with its absence, as an intermediate stage of quitting smoking. In the first group of patients there was a statistically significant improvement in quality-of-life indicators characterizing the state of physical health: physical functioning, role functioning and the total level of physical health.

Conclusions: The results confirm that the influence on the main pathogenetic links of the process by reducing the degree of exposure to the risk factor certainly improves the subjective perception of the state of one's own physical health at any stage of pathology development.

ABSTRACT BOOK

CLINICAL ASSESSMENT AND HARM REDUCTION

CHANGES IN HEMOSTASIS PARAMETERS IN SMOKING PATIENTS WITH ARTERIAL HYPERTENSION AND MULTIFOCAL ATHEROSCLEROSIS

Svetlana Vedenskaya, Olga Smolenskaya, Vadim Grachev, Ekaterina Klyachina

PP 03

Ural State Medical University,
Yekaterinburg, Russian
Federation

Background: Smoking is a main risk factor for cardiovascular events. One of the stroke reasons for smoking patients with arterial hypertension (AH) and multifocal atherosclerosis (MFA) is a violation in the hemostasis system, leading to the formation of a hypercoagulation state. The aim of this study was to establish the features of hemostatic system disorders and the possibility of their correction in smoking patients with MFA and AH.

Material and Methods: The study included 134 patients with AH and MFA (mean age - 53.7 ± 7.76 years), of which 32 (23.9%) were smokers (group 1) and 102 (76.1%) were non-smokers (group 2). The average smoking experience among group 1 was 24.21 ± 1.86 years. All 134 patients received comparable hypotensive therapy, had MFA and lipid spectrum targets. Hemostasis parameters were evaluated using a thrombodynamics test (TD) on the diagnostic laboratory system "Thrombodynamics Recorder T-2" (HemaCor, Russia).

Results: The TD test determined the qualitative and quantitative characteristics of the coagulation state of blood plasma. Analyzing the parameters of coagulation hemostasis, such TD indicators as the initial clot growth rate (V_i , $\mu\text{m}/\text{min}$) and the stationary clot growth rate (V_{st} , $\mu\text{m}/\text{min}$) were higher than the reference values in group 1. Analysis of the effect of smoking on hemostasis parameters revealed a statistical difference in smoking patients for the clot growth rate ($p=0.023$), the initial clot growth rate ($p=0.007$) and the clot size ($p=0.05$). The growth of spontaneous clots was noted in both groups, without any significant differences.

Conclusions: Smoking patients with AH and MFA, have changes in the coagulation link of hemostasis, indicating an increased risk of thrombosis. Smoking cessation should be a component of treatment. Considering that the main harm is caused by tobacco combustion products, the harm reduction concept and switching to smokeless products can be recommended for patients who are not motivated to quit smoking.

MODERN STRATEGIC VIEW OF TOBACCO SMOKING FOR THE XXI CENTURY

Manuel Pais-Clemente

PP 04

Porto University School of
Medicine, Porto, Portugal

Everybody knows that tobacco smoking is the major responsible cause for chronic respiratory diseases, cardiovascular disorders and cancer that can be prevented if we do take appropriate measures.

We recognize that a great number of actions to decrease the morbidity and mortality has been taken in the past and consequently there is a decline in the prevalence of tobacco smoking with these interventions.

We are at the beginning of the XXI Century and tobacco smoking has been around more than two thousands of years, since many civilizations in Central and South America. Those are facts that cannot be ignored. Although we acknowledge that smoking is an old concept of life, society has changed, smokers are changing and tobacco industry is developing with the introduction of new products of reduced risks; facing this reality, we do need a new attitude, new interventions and new strategies to counteract this social behavior.

We urge a different approach to this old problem, with new preventive measures, lowering the taxes for reduced risk tobacco products (less harm, less taxes), the right to correctly inform the consumers for better decisions and helping the policy makers and regulators with updated scientific-evidence and technical details concerning this issue.

We cannot just rely on traditional cigarettes behaviors because experience shows to us that continuing prevention with cessation (including those receiving psychological and pharmacological support) is not sufficient, since only 30-40% of smokers are able to quit. Nowadays, those policies should be complemented with another tool, Harm Reduction, like it happens with ST Diseases, HIV Disorders, reducing the risk of those behaviors. This is why prevention, combined with smoking cessation and complemented with Harm Reduction are the three tools that we do need to get better results dealing with this situation.

Certainly, we need more data, but we cannot wait 10-15 years in order to get the final information; my opinion is that we do have available toxicological studies and biomarkers to clarify this approach.

ABSTRACT BOOK

SMOKING CESSATION

SMOKING CESSATION INTERVENTIONS, A TOPIC OF EVER-INCREASING INTEREST TO MEDICAL PERSONNEL

Adrian Hoxha¹, Roland Shuperka², Redona Shuperka², Alba Agaraj¹, Bukurie Hysenaj¹, Artan Simaku³

PP 05

¹Department of Public Health,
Faculty of Medicine, University of
Medicine, Tirana, Albania

²NGO "For Albania without
smoking"

³Institut of Public Health, Tirana,
Albania

Background: The topics "interventions for smoking cessation" as well as "embracing harm reduction through alternative nicotine products" have been referred to family doctors in different districts over the past 5 years, as part of a continuous training activity.

Material and Methods: The activity was conducted during the years 2016-2022 for health personnel in the districts of Tirana, Elbasan, Korca, Durrës, Vlora and beyond. The level of knowledge obtained was evaluated through the forms filled in by the participants. Pre-test and Post-test were two important mechanisms through which personnel was evaluated for the knowledge they had before and after training.

Results: Four hundred seventy doctors, nurses, pharmacists, participating in these training activities have been informed about "Smoking" as a public health problem. 61% women and 39% men. Considerable participation was from both rural (42%) and urban areas (58%). Based on the evaluation of the activity it was found that 72.3% of the participants stated that they upgraded the knowledge and are able to advice and offer help if a smoker wants to stop ($p < 0.01$). The percentage of doctors who answered correctly varies from 45% to 92%.

Conclusions: It is important to increase the level of knowledge of health personnel on harm reduction as it reduces the smoking prevalence in the communities they serve among smokers who quit smoking and as well as for those smokers who do not agree to quit or cannot quit smoking by using less harmful products. Quitting smoking and harm reduction go hand in hand.

ABSTRACT BOOK

EPIDEMIOLOGY & SOCIAL ISSUES

PREVENTION OF PUBLIC HEALTH HARMS BY SWITCHING FROM TOBACCO SMOKING TO ALTERNATIVE NICOTINE PRODUCTS: REVIEW OF RESULTS OF RECENT SOCIOLOGICAL AND ECONOMIC EVALUATION IN BELARUS

Alexei Alexandrov¹, Dmitry Ruzanov², Vitaly Pisaryk²

PP 06

¹Minsk Regional Clinical Center "Psychiatry-Narcology", Minsk, Belarus

²Republican Scientific and Practical Center for Medical Technologies, Informatization, Management and Health Economics, Minsk, Belarus

Background: Belarus National Household Survey 2019 found 23.7% prevalence of adult tobacco smoking (male 43.2%, female 10.7%) and 3.8% prevalence of Electronic Nicotine Delivery Systems (ENDS) consumption (males 4.2%, females 2.3%). The total amount of DALYs lost from all risk factors in the Belarus in 2019 was 2,095,967 years (smoking responsible for 26.9%) and lost from all death causes - 3,740,663 years (15.1% - smoking-related). Tobacco Atlas Belarus in 2016 shows that tobacco smoking economic burden was 4.7 B USD.

Description: Goal of the study was the evaluation of economic costs of preventable harms to public health by switching from tobacco to reduced risk nicotine products based on modeling utilizing current prevalence of smoking and of alternative products use and their impact on health research data.

Results: Recent sociological research evaluate ENDS consumption in the adult population as 17.1% (11.0% users of e-cigarettes and 6.1% users of heated tobacco products - HTPs). Raise of HTPs use associate with decrease of smoking (from 29.6 and 3.8 in 2016 to 26.7 and 6.1 in 2020, respectively). The economic benefits of implementation of Tobacco Harm Reduction (THR) in Belarus were calculated under various models (all population, 200,000 smokers and 100,000 city population) and different levels of prevented harm (70% and 30%). All population model shows decrease of all mortality up to 8.2% with saving of 4.4 M USD. Switching of 200,000 smokers to HTPs could save 5% of DALYs lost with 31.2-72.8 M USD savings per year. 100,000 city model find lost savings are 2200-5132 of DALYs and 19.0-44.2 M USD and for 9.5 M Belarus population preventable burden will be 1,805-4,199 B USD per year.

Conclusions: Current tobacco control legal regulation in Belarus should be adapted to THR approach and public health specialists should be principal advocates of switching from tobacco to ENDS.

NEW REALITIES IN THE USE OF DIFFERENT TOBACCO DELIVERY DEVICES

Aigul Zinnatullina, Lubov Palmova

PP 07

Kazan State Medical University,
Kazan, Russian Federation

Background: The aim of study was to identify differences in groups of smokers using different tobacco delivery devices.

Material and Methods: 57 smokers were surveyed and divided into 3 groups: users of regular cigarette (RC), electronic cigarettes (EC/vapes) and heated tobacco product (HTP). No age differences were found. Research methods included a questionnaire on the use of various means of tobacco delivery, the Horn questionnaire, the Fagerström test, a scale for assessing the degree of readiness to quit smoking.

Results: The severity of nicotine addiction in 1st group was 2.2 points, in 2nd - 3.3, in 3rd - 3.6 ($p=0.01$). The degree of willingness to quit smoking was significantly lower in EC/vapes smokers (3.4 vs 5.5 and 5.9 points in groups 1 and 3). "Support" type dominated in all groups (36.8%, 46.7%, 34.3%). This type is associated with emotional stress. On the second place was "relaxation" type, especially in the EC group (30%, $p=0.003$). They smoke only in comfortable conditions. In the HTP group, the "thirst" type was significantly more common (26.4%). "Reflex", "game", "stimulation" were less common. Transfer to HTP wasn't recommended by doctors. 84% of RC smokers and 89.7% of persons from the HTP group combined smoking and alcohol or drinking coffee. Correlative analysis revealed a moderate direct relationship in the group of RC smokers ($r=0.4$).

Conclusions: 1. The severity of nicotine dependence was greatest in the HTP group, and the lowest motivation to quit smoking was in the EC/vape group. "Support" was the predominant type of smoking in all groups. "Relaxation" was the prevalence in the EC/vape group, "thirst" in the HTP group. 2. Most smokers tend to combine smoking with alcohol and coffee. 3. Medical personnel are not aware of the concept of tobacco harm reduction. It is necessary to continue work in this direction.

HEAT-NOT-BURN TOBACCO PRODUCTS AND THEIR RELEVANCE IN ORAL HEALTH

Naichia Teng

PP 08

Taipei Medical University, Taiwan

Tobacco smoking is a major risk factor for oral diseases such as oral cancer and periodontitis (US Surgeon General 2014). Dental professionals have an important role to play in providing smoking cessation advice and support to their patients who smoke and in considering this risk factor when planning and providing dental treatment. The use of heat-not-burn tobacco products (HnB) is being adopted increasingly as an alternative to smoking combusted products. Peer-reviewed evidence indicates that HnB are effective nicotine delivery devices that expose users and bystanders to substantially fewer harmful and potentially harmful compounds than smoking cigarettes. The effect of HnB on oral health is not fully understood and is still debated among many scientists and clinicians.

The number of studies addressing the potential toxic effect of HnB aerosol on oral cells is limited along with the clinical studies which are still preliminary, and their sample size is limited. The long-term effects of inhaled aerosols and the potential synergistic effect of the HnB components are not known. In this short review, we review the evidence in 4 main areas: 1) basic science studies that evaluated cell lines and tissue cultures, 2) microbiological evidence from basic science and clinical research, 3) evidence from clinical studies evaluating oral health and smoking cessation (in dental settings), and 4) evidence from epidemiological studies.

There is a clear need for further well-conducted studies in this field. Those areas that have the strongest potential to benefit patients are understanding the oral health consequences in nonsmokers who initiate HnB use, establishing the effectiveness of HnB as a tobacco quit aid (especially within the dental setting), and understanding any impacts on periodontal health and oral cancer in smokers who switch to HnB.

ABSTRACT BOOK

EPIDEMIOLOGY & SOCIAL ISSUES

ANALYSIS OF AWARENESS AND READINESS OF PATIENTS WITH MALIGNANT NEOPLASMS TO QUIT SMOKING AS A FACTOR INFLUENCING OVERALL SURVIVAL

Sufia Safina, Aigul Fayrushina

PP 09

GAUZ, Kazan, Republic of
Tatarstan, Russian Federation

Background: Our objective was to identify smoking cessation in patients with MNS in order to investigate the possibility of implementing a specialized smoking cessation assistance program or reducing the harm from tobacco smoking.

Material and Methods: An initiative group developed an online questionnaire stratified by smoking, length of service, sex, age, comorbidities, educational level, financial status, smoking cessation methods, other addictions. The survey of 556 patients treated in Prof. M.Z. Segal's Republican Clinical Hospital of RT was conducted, among them 262 people have the status of an active smoker.

Results: The greatest percent of smokers was found among men – 89.3% of age more than 60 years old. The duration of smoking experience was more than 5 years in 81.9% of patients, and the habit manifested before 18 years in 57.6%. 67.1% of the respondents smoked more than a pack of cigarettes a day, 45% of the patients had a history of concomitant pathologies of the cardiovascular and respiratory systems. 88.2% of those surveyed had tried to quit smoking, only 14% were able to quit. A high motivation to quit smoking was found among 63% of the patients surveyed because the process of quitting smoking can be long-term and quit attempts are not always successful; this is due to the nicotine addiction of the patients. 42% of the respondents tried to quit smoking 1-2 times. 19.8% made 3 to 5 attempts to quit. 9.9% tried to quit smoking over 5 times, and 28.2% of the patients responded that they had never tried to quit smoking. 35.4% of continuing smokers had sought help from specialists to quit; of these, 7.5% had a maximum interval of more than a year without smoking. 10.7% were able to abstain from smoking for 6 to 12 months. 48.3% of respondents had a maximum interval of less than 6 months without smoking. 4.5% of the respondents answered that they decided to quit smoking because of their disease, and the maximum period of abstinence from smoking for these patients was less than 6

ABSTRACT BOOK

months. 33% of patients responded that they could not quit smoking for a single day. These patients are not motivated or cannot quit smoking. In order to minimize the toxic effects of tobacco smoking, switching to HTS can be recommended because the HTS aerosol does not contain combustion products that are potentially harmful to the body.

Conclusions: The high compliance identified indicates the need to provide patients with tobacco cessation assistance. Smoking cessation should be a component of cancer treatment. Patients who are unwilling or unable to quit completely can be advised on the concept of harm reduction.

ABSTRACT BOOK

TOXICOLOGY AND AEROSOL CHEMISTRY

COMPARATIVE TOXICOLOGICAL ASSESSMENT OF CIGARETTES AND NEW CATEGORY PRODUCTS VIA AN *IN VITRO* MULTIPLEX PROTEOMICS PLATFORM

Nikos Tsolakos¹, Linsey E. Haswell², Fabio Miazzi², Emma Bishop², **David Smart²**, Asier Antoranz¹, Vaia Pliaka¹, Angeliki Minia¹, Leonidas G. Alexopoulos^{1,3}, Marianna Gaca², Damien Breheny²

PP 10

¹Protavio Ltd, Agia Paraskevi, Attiki, Greece

²B.A.T. (Investments) Limited, Southampton, UK

³Biomedical Systems Laboratory, School of Mechanical Engineering, National Technical University of Athens, Greece

Cigarette smoking is a risk factor for several diseases such as cancer, cardiovascular disease (CVD), and chronic obstructive pulmonary diseases (COPD), however, the underlying factors are not fully understood. Alternative nicotine products with reduced risk potential (RRPs) including heated tobacco products (HTPs) and e-cigarettes have recently emerged as a viable alternative to cigarettes, that may contribute to the overall strategy of tobacco harm reduction due to the significantly lower levels of toxicants and potentially harmful constituents in these products' emissions as compared to cigarette smoke. Assessing the effects of RRP on biological responses is important to demonstrate the potential value of RRP towards tobacco harm reduction. Here, we evaluated the inflammatory and signaling responses of human lung epithelial cells to aqueous aerosol extracts (AqE) generated from the 1R6F reference cigarette, the glo™ HTP, and the Vuse ePen 3 e-cigarette using multiplex analysis of 37 inflammatory and phosphoprotein markers. Cellular exposure to the different RRP and 1R6F AqEs resulted in distinct response profiles with 1R6F being the most biologically active followed by glo™ and ePen 3. 1R6F activated stress-related and pro-survival markers c-JUN, CREB1, p38 MAPK and MEK1 and led to the release of IL-1 α . glo™ activated MEK1 and decreased IL-1 β levels, whilst ePen 3 affected IL-1 β levels but had no effect on the signaling activity compared to untreated cells. Our results demonstrated the reduced biological effect of RRP and suggest that targeted analysis of inflammatory and cell signaling mediators is a valuable tool for the routine assessment of RRP.

ABSTRACT BOOK

TOXICOLOGY AND AEROSOL CHEMISTRY

PREVALENCE AND PATTERNS OF CIGARETTE SMOKING AMONG MEDICAL STUDENTS

Adrian Hoxha¹, Roland Shuperka², Artan Simaku^{2,3}

PP 11

¹Faculty of Medicine, Tirana
Medical University, Albania

²National Association of Public
Health of Albania

³Institute of Public Health, Tirana,
Albania

Background: Tobacco smoking is a major public health problem throughout the world, especially for young adults. While smoking prevalence has a decrease among developed countries, for other countries it is still an increasing risk factor for public health. The study describes the prevalence of different forms of smoking, and the correlates of current smoking.

Material and Methods: The study enrolled a total of 336 students from Tirana Medical University who fulfilled an anonymous self-administered online questionnaire regarding tobacco and e-cigarettes smoking during the year 2022.

Results: Sixty four percent of respondents reported ever smoking whereas the overall prevalence of daily cigarette smoking was 10.5% accounting for 22% of males and only 2.4% of the females with a higher prevalence for those aged 21–23 years (44%). The mean age of starting smoking was 15.3 (± 4.6) years with a range 11–17 years old. Only 6% of current smokers use e-cigarettes and vaping devices. Older participants were more likely to report smoking more cigarettes/day. Only 5.8% reported to discuss in family about the harm from smoking. In logistic regression analysis older age, living away from home, smoking by family and close friends, a lower level of parents' education and exposure to tobacco promotion were predictors of current smoking status. Only 35% of students have tried to quit smoking.

Conclusions: The results of this study provide interesting insights on smoking among students and can be used to help develop an effective health promotion program to prevent smoking among university students.

ABSTRACT BOOK

PRECLINICAL EVALUATION

QUANTITATIVE ADVERSE OUTCOME PATHWAY: A NEW PREDICTION TOOL TO ASSESS HUMAN RISK OF DECREASED LUNG FUNCTION WHEN SWITCHING FROM COMBUSTIBLE CIGARETTES TO HEATED TOBACCO PRODUCTS

Carole Mathis, Alain Sewer, Florian Calvino, Karsta Luettich, Anita Iskandar, Marja Talikka

PP 12

R&D, Philip Morris International

Adverse outcome pathways (AOPs) are simple linear or branching paths representing a sequence of molecular, cellular, tissue, and organ level perturbations (or “key events”). They are triggered by the interaction between a particular compound and a cellular component (identified as the “molecular initiating event”) that precedes an adverse outcome (AO) at the organism or population level. AOPs integrate data from alternative test methods in line with the “3R” paradigm (to refine, reduce, and replace laboratory animals) and serve the development of new predictive tools for hazard assessment.

Here, we took advantage of the AOP 411 that describes how increased oxidative stress, reduced ciliary beat frequency (CBF), and reduced mucociliary clearance (MCC) sequentially lead to decreased lung function to develop mathematical models reflecting the relationships between key events and allowing the quantification of AO prediction.

As a case study, we evaluated the potential risk of impaired lung function associated with tobacco heating system (THS) use compared with cigarette smoking, by using data from a series of *in vitro* studies on the THS, employing advanced human tissue culture models, and by mapping them in the AOP 411. Our new quantitative AOP (qAOP) predicted a 48.7% reduced risk of decreased CBF based on measurement of oxidative stress indicators and 18.4% reduced risk of decreased MCC based on measurement of CBF in THS aerosol compared with cigarette smoke-exposed cultures.

Finally, modeling based on human MCC data predicted a 79.3% reduced risk of decreased lung function in heated tobacco product switchers compared with smokers. In summary, the development and use of this new qAOP may be a potent alternative to evaluate the risk of decreased lung function in the context of tobacco harm reduction while waiting for long-term clinical studies and epidemiological data.

6th Summit Tobacco Harm Reduction

Novel products, Research & Policy

25-26 SEPTEMBER 2023 | ATHENS
ROYAL OLYMPIC HOTEL

AUTHORS' INDEX

6th Summit Tobacco Harm Reduction

Novel products, Research & Policy

25-26 SEPTEMBER 2023 | ATHENS
ROYAL OLYMPIC HOTEL

AUTHORS' INDEX

A

ABDULKHAKOV SAYAR R. OP21
ABELIA XYLIA-ANNISA OP09
AGARAJ ALBA PP05
ALEXANDROV ALEXEI PP06
ALEXOPOULOS LEONIDAS G. PP10
ALHARTHI ZAINA OP31
AL-TOBI MOHAMMED OP31
ANTORANZ ASIER PP10
ARNAUTOV VLADIMIR PP01
ARSENIJEVIC ALEKSANDAR OP10,
OP12, OP31
AZZOPARDI DAVID OP16,
OP22, OP23

B

BARBOUNI ANASTASIA OP07
BARLIANA MELISA-INTAN OP09
BEKZHANOVA AISULU PP01
BELAMRI PIERRE OP17
BISHOP EMMA OP28,
PP10
BREHENY DAMIEN OP28,
PP10
BROWN ELAINE OP22

C

CALVINO FLORIAN PP12
CAPONNETTO PASQUALE OP04
CARUSO MASSIMO OP31
CHERNOVA ANNA OP13,
OP25, OP26
COSTA AURORA OP31

D

DIMITRIJEVIC-STOJANOVIC MILICA
OP10, OP12
DISTEFANO ALFIO OP31

E

EAST NICOLE OP28
EDWARD LAUREN OP14
ELVERS BO OP16
EMMA ROSALIA OP31
ENGELI VASILIKI OP19,
OP20
ESAULOVA NATALYA OP01

F

FAIZULLIN RASHAT I. OP21
FAYRUSHINA AIGUL PP09
FIEBELKORN STACY OP28
FILIPPOV ALEKSANDR OP18
FROSINA JUSTIN OP23
FUOCHI VIRGINIA OP31
FURNERI PIO-MARIA OP31

G

GACA MARIANNA OP28,
PP10
GALE NATHAN OP22,
OP23
GIORDANO ANTONIO OP31
GOSS CAROL OP14
GRACHEV VADIM PP03
GREY ADAM OP14
GRIGORYEVA TATYANA V. OP21

H

HAMPSHER-MONK SAMUEL OP32
HASWELL LINSEY E. OP22,
OP23, PP10
HATZAKIS ANGELOS OP19,
OP20
HOXHA ADRIAN PP05,
PP11
HYSENAJ BUKURIE PP05

I

IKONOMIDIS IGNATIOS OP29
IMYANITOV EVGENY N. OP24
ISKANDAR ANITA PP12

6th Summit Tobacco Harm Reduction

Novel products, Research & Policy

25-26 SEPTEMBER 2023 | ATHENS
ROYAL OLYMPIC HOTEL

AUTHORS' INDEX

J

JAKOVLJEVIC VLADIMIR OP10,
OP12
JELSTRUP DANIEL OP16
JILANI TASHEEN OP16

K

KAKANOV ALEKSANDR OP06
KANITSCHIEDER CLAUDIA OP16
KASTRATOVIC NIKOLINA OP10,
OP12
KATOGIANNIS KONSTANTINOS
OP29
KATSANAKI ELENI OP29
KAWAGUCHI MASAKI OP27
KIASSOV ANDREY P. OP21
KLYACHINA EKATERINA PP03
KOSTELLI GAVRIELLA OP29
KOUKIA EVMORFIA OP08
KOUMAL ONDREJ OP17
KOUREA KALLIRHOE OP29
KROSHKINA IRINA OP05
KUZUBOVA NATALIYA OP05

L

LAGIOU ARETI OP07
LAMBADIARI VAIA OP29
LESMANA RONNY OP09
LI-VOLTI GIOVANNI OP31
LOPUKHOV LEONID V. OP21
LUETTICH KARSTA PP12

M

MAKHMUTOVA VIKTORIIA OP05
MANGOULIA POLYXENI OP08
MARATOU EIRINI OP29
MARKOVIC VLADIMIR OP10,
OP12
MATHIS CAROLE PP12
MCEWAN MICHAEL OP22,
OP23
MEICHANETZIDIS FILIMON OP22,
OP23
MESIAKARIS KONSTANTINOS OP31
MIAZZI FABIO OP28,
PP10
MINIA ANGELIKI PP10
MITIUSHKINA NATALIA V. OP24

N

NEUBERT CHRISTOPH OP03
NIKULINA SVETLANA OP13,
OP25, OP26
NUSSBAUM ALEXANDER K. OP03

O

OBREZAN ANDREY OP18

P

PAIS-CLEMENTE MANUEL PP04
PALMOVA LUBOV PP07
PANTIĆ IGOR OP30
PAPADOSIFAKI GEORGIA OP07
PAPIC DRAGANA OP12
PARTSINEVELOS KONSTANTINOS
OP31
PAVLIDIS GEORGE OP29
PAVLOVIC DRAGICA OP12
PELEVINA IRINA OP06
PIROZHKOVA EKATERINA OP05
PISARYK VITALY PP06
PLIAKA VAIA PP10
POLOSA RICCARDO OP09,
OP31
POULAS KONSTANTINOS OP31
PRASAD KRISHNA OP14,
OP16
PROCHNAU TODDERICK OP15
PULVIRENTI ROBERTA OP31

R

REFITSKAIA NATALIA OP05
RUST SONJA OP31
RUZANOV DMITRY PP06

6th Summit Tobacco Harm Reduction

Novel products, Research & Policy

25-26 SEPTEMBER 2023 | ATHENS
ROYAL OLYMPIC HOTEL

AUTHORS' INDEX

S

SAFINA SUFIIA PP09
SAKELLARI EVANTHIA OP07
SEKINE YOSHIKA OP27
SEWER ALAIN PP12
SHAPOROVA NATALIIA OP06
SHARMAN ALMAZ PP01
SHETTY MANDARA OP16
SHUPERKA ROLAND PP05,
PP11
SHUPERKA REDONA PP05
SIMAKU ARTAN PP05,
PP11
SMART DAVID OP28,
PP10
SMOLENSKAYA OLGA PP03
STEVANOVIC RANKO OP02
SUKHOVSKAYA OLGA A. OP24
SUN ANG OP31
SYPSA VANA OP19,
OP20

T

TALIKKA MARJA PP12
TAYUTINA TATYANA PP02
TENG NAICHIA PP08
TEWES NELSON OP03
THORNE DAVID OP28
THYMIS JOHN OP29
TOPI MARIA OP08
TSOLAKOS NIKOS PP10
TUKTAROV ARTUR OP18
TYULEBEKOVA GULNARA PP01

V

VALODIA PRANEET OP11
VEDENSKAYA SVETLANA PP03
VEL SENTHIL OP22,
OP23
VOLAREVIC ANA OP10,
OP12
VOLAREVIC VLADISLAV OP10,
OP12, OP31

W

WADE CARRIE OP33

Y

YERMAKOVA IRINA PP01

Z

ZADJALI FAHAD OP31
ZADJALI RAZAN OP31
ZINNATULLINA AIGUL PP07

