

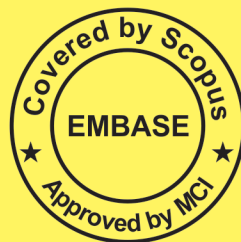
ISSN-0973-9122 (Print) • ISSN-0973-9130 (Electronic)

Volume 13 / Number 1 / January-March 2019



Indian Journal of Forensic Medicine & Toxicology

Website: www.ijfmt.com



Official Organ of Indian Association of Medico-Legal Experts (Regd.)

Indian Journal of Forensic Medicine & Toxicology

EDITOR

Prof. R K Sharma

Formerly at All India Institute of Medical Sciences, New Delhi
E-mail: editor.ijfamt@gmail.com

INTERNATIONAL EDITORIAL ADVISORY BOARD

1. **Dr Nuwadatta Subedi** (*In Charge*) Dept of Forensic Med and Toxicology College of Medical Sciences, Bharatpur, Nepal
2. **Dr. Birendra Kumar Mandal** (*In charge*) Forensic Medicine and Toxicology, Chitwan Medical College, Bharatpur, Nepal
3. **Dr. Sarathchandra Kodikara** (*Senior Lecturer*) Forensic Medicine, Department of Forensic Medicine, Faculty of Medicine, University of Peradeniya, Sri Lanka
4. **Prof. Elisabetta Bertol** (*Full Professor*) Forensic Toxicology at the University of Florence, Italy
5. **Babak Mostafazadeh** (*Associate Professor*) Department of Forensic Medicine & Toxicology, Shahid Beheshti University of Medical Sciences, Tehran-Iran
6. **Dr. Mokhtar Ahmed Alhrani** (Specialist) Forensic Medicine & Clinical Toxicology, Director of Forensic Medicine Unit, Attorney General's Office, Sana'a, Yemen
7. **Dr. Rahul Pathak** (*Lecturer*) Forensic Science, Dept of Life Sciences Anglia Ruskin University, Cambridge, United Kingdom
8. **Dr. Hareesh** (*Professor & Head*) Forensic Medicine, Ayder Referral Hospital, College of Health Sciences, Mekelle University, Mekelle Ethiopia East Africa

SCIENTIFIC COMMITTEE

1. **Pradeep Bokariya** (*Assistant Professor*) Anatomy Dept. Mahatma Gandhi Institute of Medical Sciences, Wardha, Maharashtra
2. **Dr Anil Rahule** (*Associate Professor*) Dept of Anatomy, Govt Medical College Nagpur
3. **Dr Yadaiah Alugonda** (*Assistant Professor*) Forensic Medicine, MNR Medical College, Hyderabad
4. **Dr Vandana Mudda** (Awati) (*Associate Prof*) Dept of FMT, M.R. Medical College, Gulbarga, Karnataka,
5. **Dr. Lav Kesharwani** (*Asst. Prof.*) School of Forensic Science, Sam Higginbottom Institute of Agriculture Technology & Sciences, Allahabad U.P.,
6. **Dr. Nishat Ahmed Sheikh** (*Associate Professor*) Forensic Medicine, KIMS Narketpally, Andhra Pradesh
7. **Dr K. Srinivasulu** (*Associate Professor*) Dept of Forensic Medicine & Toxicology, Medciti Institute of Medical sciences, Ghanpur, MEDCHAL Ranga Reddy, Dist.AP_501401.
8. **Dr. Mukesh Sharma** (*Senior Scientific Officer*) Physics Division, State Forensic Science Laboratory, Jaipur, Rajasthan
9. **Dr. Amarantha Donna Ropmay** (*Associate Professor*) NEIGRIHMS, Shillong
10. **Dr Basappa S. Hugar** (*Associate Professor*) Forensic Medicine, M.S. Ramaiah Medical College, Bangalore
11. **Dr. Anu Sharma** (*Associate Prof*) Dept of Anatomy, DMCH, Ludhiana (PB)

"Indian Journal of Forensic Medicine & Toxicology" is peer reviewed quarterly journal. It deals with Forensic Medicine, Forensic Science, Toxicology, DNA fingerprinting, sexual medicine and environment medicine. It has been assigned International standard serial No. p-0973-9122 and e- 0973-9130. The Journal has been assigned RNI No. DELENG/2008/21789. The journal is indexed with Index Copernicus (Poland) and is covered by EMBASE (Excerpta Medica Database). The journal is also abstracted in Chemical Abstracts (CAS) database (USA). The journal is also covered by EBSCO (USA) database. The Journal is now part of UGC, DST and CSIR Consortia. It is now official publication of Indian Association of Medico-Legal Experts (Regd.).

NATIONAL EDITORIAL ADVISORY BOARD

1. **Prof. Shashidhar C Mestri** (*Professor*) Forensic Medicine & Toxicology, Karpaga Vinayaga Institute of Medical Sciences, Palayanoor Kanchipuram Distric, Tamil Nadu
2. **Dr. Madhuri Gawande** (*Professor*) Department of Oral Pathology and Microbiology, Sharad Pawar Dental College, Sawangi, Wardha.
3. **Dr. T.K.K. Naidu** (*Prof & Head*) Dept of Forensic Medicine, Prathima Institute of Medical Sciences, Karimnagar, A.P.
4. **Dr. Shalini Gupta** (*Head*) *Faculty of Dental Sciences*, King George Medical University, Lucknow, Uttar Pradesh
5. **Dr. Pratik Patel** (*Professor & Head*) Forensic Medicine Dept, Smt NHL Mun Med College, Ahmedabad
6. **Devinder Singh** (*Professor*) Department of Zoology & Environmental Sciences, Punjabi University, Patiala
7. **Dr. Pankaj Datta** (*Principal & Head*) Department of Prosthodontics, Inderprasth Dental College & Hospital, Ghaziabad
8. **Dr. Mahindra Nagar** (*Head*) Department of Anatomy, University College of Medical Science & Guru Teg Bahadur Hospital, Delhi
9. **Dr. D Harish** (*Professor & Head*) Dept. Forensic Medicine & Toxicology, Government Medical College & Hospital, Sector 32, Chandigarh
10. **Dr. Dayanand G Gannur** (*Professor*) Department of Forensic Medicine & Toxicology, Shri B M Patil Medical College, Hospital & Research centre, Bijapur-586101, Karnataka
11. **Dr. Alok Kumar** (*Additional Professor & Head*) Department of Forensic Medicine & Toxicology, UP Rural Institute of Medical Sciences and Research, Saifai, Etawah. -206130 (U.P.), India.
12. **Prof. SK Dhatarwal**, Forensic Medicine, PGIMS, Rohtak, Haryana
13. **Prof. N K Aggrawal** (*Head*) *Forensic Medicine*, UCMS, Delhi
14. **Dr. Virender Kumar Chhoker** (*Professor*) Forensic Medicine and Toxicology, Santosh Medical College, Ghaziabad, UP

Print-ISSN:0973-9122 Electronic - ISSN: 0973-9130

Frequency: Quarterly, © All Rights reserved The views and opinions expressed are of the authors and not of the Indian Journal of Forensic Medicine & Toxicology. Indian Journal of Forensic Medicine & Toxicology does not guarantee directly or indirectly the quality or efficacy of any products or service featured in the advertisement in the journal, which are purely commercial.

Website: www.ijfamt.com

Editor

Dr. R.K. Sharma
Institute of Medico-legal Publications
Logix Office Tower, Unit No. 1704, Logix City Centre Mall,
Sector- 32, Noida - 201 301 (Uttar Pradesh)

Printed, published and owned by

Dr. R.K. Sharma
Institute of Medico-legal Publications
Logix Office Tower, Unit No. 1704, Logix City Centre Mall,
Sector- 32, Noida - 201 301 (Uttar Pradesh)

Published at

Institute of Medico-legal Publications
Logix Office Tower, Unit No. 1704, Logix City Centre Mall,
Sector- 32, Noida - 201 301 (Uttar Pradesh)



1. Knowledge and Perceptions Regarding Medical Termination of Pregnancy among Medical and Non-medical Students 01
Vijay Kumar, Jaswinder Singh, Somshekhar Sharma
2. A Comparative Study on Cephalic and Facial Indices among Students from Southern Parts of India 04
Senthil Kumaran M, G Shrikanthan
3. Correlation of Attributes of Homicide Cases with its Severity based on Homicide Injury Scale 10
Sunil Subramanyam, Joshima Janardhanan
4. Study of Pattern of Skull Fractures in the Victims of Unnatural Deaths Due to Head Injury Caused by Road Traffic Accidents (RTA) at Kanpur, India 14
Dinesh Kumar, Sushil Kumar, Alok Kumar, Archana Verma
5. Detection and Estimation of Arsenic and Lead in Coconut Water - A Kerala Study 19
Pillay VV, Anu Sasidharan, Arathy SL, Sundaram K R, Greeshma C R
6. The Presence of Diatoms in Liver Tissue in Non Drowning Cases: An Autopsy based Study 25
Moumitha Kartha, Ramakrishnan UK, Balachandran Ajay, B Umadethan
7. A Study on Deaths by Suicidal Hanging in Bengaluru 32
Ravi Raj K G, MadhuSudhana Reddy D, Lohith R, Abhishek Yadav
8. Vitamin C as a Potential Indicator of Post-Mortem Interval: A Biochemical Analysis 35
Nidhi Mahajan, Romalpreet, Sunil Kumar Sharma, Mohit Kumar, Rajat Sandhir
9. Age Determination of Prostitute Women by Radiological Investigation 40
N A Devraj, K M Chaudhari, A G Pathak, R K Gadhari, P S Gavale
10. Study of Estimation of Stature from Head Height 46
Singh Satbir, Vakil Nishu, Kaur Balbir, Kaur Taranpreet
11. Medico-legal Evaluation of Death due to Poisoning 52
Awasthi PM, Dev R, Verma S, Pathak A, Bajpai A, Bharti A, Kumar A
12. Study of Knowledge among the Resident Doctors Regarding Various Aspects of Medicolegal Cases at a Tertiary Care Teaching Hospital of North India 57
Mohammad Sarwar Mir, Farooq A Jan, G.H Yattoo
13. Sex Determination using Mental Foramen in Chennai Population 63
Karpagavalli Shanmugasundaram, S Prasanthi
14. Trends of Death due to Poisoning among Females at a Tertiary Care Centre in North Karnataka 67
Ravindra Kumar C N, Gajanan H Nayak, Sunilkumar S Biradar, Madhu Sudhan S, Mahalaxmi Karlawad, Muthamizh Selvan

15. A Systematic Analysis of Medicolegal Radiological Investigations and Quantification of the Burden of Court Evidences on Radiology Department of a Tertiary Level Teaching Institute of North India 72
Chauhan Narvir S, Sood D, Soni Pawan K, Manjuswamy H R, Sharma Kirti K
16. A Profile of Electrocution Deaths 79
SantoshKumar P, Gajanan H Nayak, Mahalaxmi B Karlawad
17. Tobacco Addiction: A Survey of a Group of Students 84
Badr Adouani, Youssef Moutaouakil, Mina Ait Elcadi, Rachid Eljaoudi, Ahmed El Yaakoubi, Yahya Cherrah, Yassir Bousliman
18. Profile of Cases of Alleged Medical Negligence at Tertiary Care Centre:- A Retrospective Study 89
Manoj B Patekar, Kailas U Zine, Ramesh N Wasnik
19. Knowledge and Perception among Medical Students towards People with HIV and AIDS 94
Manu Sharma, Sneha Sharma
20. Estimation of Femur Length from Fragments- A Study on Adult Femora 97
Betty Anna Jose, Padmini Hannah Noone
21. A Study of Caffeine Consumption Patterns and Dependence among Management and Science University Students 101
Nor Alya AtikahRamli, Venkata Pavan Kumar Sriperumbuduru, Hasanain Faisal Ghazi, Nava Jyothi Dalayi
22. An Epidemiological Study of Different Aspect of Child Maltreatment in Siliguri Police Commissionerate 106
Gautam Kumar, Rajib Prasad, Priyankar Roy, Vivek Kumar, Saikat Saha, Aman Kumar
23. Study of Pattern of Thoracoabdominal Injuries in Railway Deaths 111
Satish K V, Shobhana S S
24. A Study on Histopathological Changes in Deaths due to Burns 115
Shivanand S Talewad, Aadamali A Nadaf, Vijayalaxmi S Talewad
25. Incidental Diagnosis of Tuberculosis on Histopathology: A 6 Year Autopsy Study 120
Manmeet Kaur, Kanwardeep Kaur Tiwana, Sarita Niborhia, Nisha Singla
26. Sex Determination and Personal Identification using Frontal Sinus and Nasal Septum – A Forensic Radiographic Study 125
Gayathri Mohan, Sreedevi Dharman
27. Current Status of Knowledge, Attitude and Awareness of Medical Students on Forensic Autopsy in Tumkur District of Karnataka 131
Madhu Sudhan S, Hemanth Raj M N
28. The Pattern of Blunt Abdominal Injuries among Autopsies Conducted at Mysore Medical College and Research Institute 135
Dayananda R, ShivaKumar K T, Kumar M P
29. Comprehensive and Analytical Study of Medico Legal Autopsies at Tertiary Care Center 139
Boddupally Ravi Kumar, Nishat Ahmed Sheikh

30.	Comparative Analysis of Computed Tomography Scan and Post Mortem Findings in Cases of Head Injury at a Tertiary Health Centre	144
	<i>Mahesh R Sabale, Narendra B Kumar, Hemant G Kukde, Arun K Jaiswani</i>	
31.	To Study Natural Variations in Handwriting with Temperature Variation	150
	<i>Ujaala Jain, Chauhan Amit, Ahuja Pooja, Dahiya M S</i>	
32.	Sexual Dimorphism in the Mandibular Canine - A Study in South Indian Population	155
	<i>Vinay J, R V Suresh Balaji, Anand Kumar V, Thejaswini P</i>	
33.	A Study of Demographic Profile of Death Due to Burns	162
	<i>Shivanand S Talewad, Aadamali A Nadaf, Vijayalaxmi S Talewad</i>	
34.	Study of Craniocerebral Injuries in Chitradurga Region	168
	<i>Manjunatha K, Chandan V, Viswanathan K G, Narasimhamurthy</i>	
35.	Determination of Stature from Hand Length in Adults: A Regional Study in Chennai	172
	<i>Venkatachalam K S M, Srinivasaragavan N, John William Felix A</i>	
36.	Prospective Anaylsis of Electrolytic Changes in Vitreous Humour Regarding Estimation of Time Since Death	177
	<i>R Mohamed Nasim, T Selvaraj</i>	
37.	Studies on Prevalence of Accessory Tooth Cusps in Some Ethnic Populations of Northern India and their Forensic Relevance	181
	<i>Pooja Puri, S K Shukla, I Haque</i>	
38.	Analysis and Outcome of Head Injury Cases due to RTA in Tertiary Hospital in North West Uttar Pradesh	186
	<i>Pranav Kumar, Jaswinder Singh, Somshekhar Sharma, Soumik Chatterjee</i>	
39.	Awareness among Undergraduate Medical Students about the Acid Attack in Criminal Law (Amendment) Act, 2013	190
	<i>G. Shrikanthan, Senthil Kumaran M, Amudharaj</i>	
40.	Study of Awareness of Cyber-Security among Medical Students	196
	<i>Pratapsingh Rathod, Ashutosh B Potdar</i>	
41.	Autopsy Study of Thoraco-Abdominal Injuries in Road Traffic Accidents in Chitradurga	199
	<i>Chandan V</i>	
42.	Challenge in Management of Aggressive Clients in Psychiatric Setting: Development of Four-Point Physical Restraints	205
	<i>Binil V, Christopher Sudhaker, Supriya Hegde, Unnikrishnan B, Alphonsa Ancheril</i>	
43.	Pattern of Unnatural Deaths in Jammu Province of J&K	210
	<i>Sandhya Arora, Shaveta Sharma</i>	
44.	Assessment of Nurses' Knowledge about Restraint and Seclusion used for Aggressive Patients in Psychiatric Wards	212
	<i>Nibras H. Abdel-Hussein, Saja H. Mohamed</i>	

45.	Effectiveness of an Education Program on Nurses' Knowledge about the Triage System in Emergency Department of Qalat Salih Hospital	218
	<i>Hayder Ali Hussein , Hakima Shaker Hassan</i>	
46.	Gastric Aspirates Gram Stain in Early Detection of Neonatal Sepsis	224
	<i>Ammar M. Ata-Allah , Emad R. Al-Sadoon, Ashoor R. Sarhat</i>	
47.	Effectiveness of Educational Program on Nurses' Knowledge toward Preventing Female Catheter-Associated Urinary Tract Infections	230
	<i>Hiba T. Mohammed , Rajha Abdul Hassan Hamza</i>	
48.	Hereditary Human Disorders Identification through Finger Print Analysis	236
	<i>Raid Abd Alreda Shekan, Ahmed Mahdi Abdulkadium , Ali Mohammed Abdul Majid</i>	
49.	Immunohistochemical Assessment of SOX2 Expression in Iraqi Patients with Gastric Carcinoma (GC) ...	241
	<i>Hanan Jameel Ashour, Kifah Hamdan AbdulGhafour, Nahla A. Al-Bakr</i>	
50.	Serum IgE Level in Systemic Lupus Erythematosus Associated Nephropathy	247
	<i>Izzat Abdulsatar Al-Rayahi, Raghad Hassan Sanyi , Ali Abd Alhussein Mahdi</i>	
51.	Effectiveness of An Instructional Program of Premarital Screening for Hereditary Blood Diseases on Student's Knowledge at Baghdad University	252
	<i>Aqdas D. Salman , Iqbal M. Abass</i>	
52.	Evaluation of Anti-nociceptive Activity of 940 Nanometer Low Level Laser Therapy on Temporomandibular Joint in Rats	259
	<i>Ali Imad Al-Khassaki, Jamal Noori Al-Jubori, Ammar Saleh Al-Alawi, Mohammed Abood Al-Maliky, Ghada Ibraheem Al-Bedran</i>	
53.	Hypertension Screening in Adults under Thirty in Babylon Community	264
	<i>Balqees Salman Fahad, Hussein Jassim</i>	
54.	Hypertensive Patients' Practices Regarding Lifestyle Changes in AL- Amarah City at South of Iraq	269
	<i>Thani Asmar Radhi, Amjad Hashim Mohammed, Saad Sabri Shamkh</i>	
55.	Impact of Domestic Violence upon Juvenile Delinquent at Correctional Institutions in Baghdad City	276
	<i>Siham Hameed Aliue, Saja .H. Mohamed</i>	
56.	Impact of Education Program Regarding Antipsychotics-related Side Effects upon Knowledge of Nurses working in Psychiatric Teaching Hospitals of Baghdad City	281
	<i>Ali Mlaghy Shakhat Al-Salhee , Maan Hameed Ibrahim Al-Ameri</i>	
57.	Microbiological Quality of Milk, Cheese, Yogurt and ICE Cream in Baghdad City Markets	287
	<i>Khaleel M. Mahdi</i>	
58.	The Relation between Lymphopenia and Mortality Rate in Elderly COPD Patients	293
	<i>Rafid Hadi Hameed</i>	
59.	Tongue Print Features Extraction By Gabor Filters Family	298
	<i>Maryam A. Yousif¹, Jamila H.Saud</i>	
60.	VTE Risk in Postmenopausal Women Receiving Oral and Non-Oral Hormone Therapy Systematic Review and Meta-Analysis	302
	<i>Rafid Hadi Hameed</i>	

61. Effectiveness of an Education Program on Life-Style of Patients with Myocardial Infarction in Al Nasiriyah Hospitals 307
Qasim Ali Khasal, Hussein Hadi. Atiyah , Sameer Razzaq Oleiwi
62. Effectiveness of Punica Granatum and Propolis: A New Dressing Method in Management of Diabetic Foot Ulceration 314
Noor Sabry Hameed Al-Irayfawee , Diao K. A. A. Al-Biatey, Zainab A. H. Al- Mubarak
63. Causes of Sudden Death in Athletes Referred from 2011 to 2017 to the Laboratory Diagnostic Center of Tehran Legal Medicine Organization 321
Abdolrazagh Barzegar, Mahboubeh Asgari, Hamed Salehbarmi
64. Comparison of Blood Lead Levels Between Oral and Inhalation Opium Addicts and its Relationship with Hematological Parameters 336
Ali Akbar Shafikhani, Amir Mohammad Kazemifar
65. Comparison between the beneficial Effects of Low Level Laser Therapy (Diode Laser) and Transcutaneous Electrical Nerve Stimulation in Recovery of Patients with Bell's palsy 332
Ali Mihsen Hussein Alyassiri , Taghreed Fadil Zaidan
66. Exploring the Concept of Spirituality among Patients with Chronic Illnesses: A Conventional Content Analysis 338
Ebrahimi Belil Fatemeh, Alhani Fatemeh, Ebadi Abbas, Anoshirvan Kazemnejad
67. The Effect of Hot- and Cold-natured Foods on the Vital Signs in the Human 344
Abbasali Abbasnezhad; Mohamad Masoumzadeh; Hamid Rasekhi, Hassan Irani, Mojtaba Kianmehr
68. Detoxifying of Nicotine in Smoker with Consumption of Food Containing CYP 2A6 Enzyme from Beef Liver 350
Abdul Rohim Tualeka, Siti Rahayu Nadhiroh
69. Acute Bronchitis: General Health Survey Prospective Study 355
Israa Adnan Ibraheam, Imad Hadi Hameed
70. Diagnosis of Trauma Mechanism and Study of Fractures According to Various Characteristics 360
Israa Adnan Ibraheam, Imad Hadi Hameed, Basim Mohammed Dhahir
71. Evaluation of Noncardiac Chest Pain (NCCP) in Iranian Patients with Nonerosive Reflux Disease (NERD) based on 24-Hour Multichannel Intraluminal Impedance-pH (MII-PH) Monitoring Tests 366
Hashem Fakhre Yaseri
72. Evaluation and Study of Recrystallization on Polymorph of Dexamethasone by Using GC-MS and FT-IR Spectroscopy 372
Ali Kadhim Aljarah, Imad Hadi Hameed, Mohammed Yahya Hadi
73. Study of Cyproheptadine Polymorphs Present in Tablets Available in Iraqi Pharmaceutical Markets 378
Mohammed Yahya Hadi, Imad Hadi Hameed, Israa Adnan Ibraheam
74. Severe Injury of Burns: Retrospective Study in a Teaching Hospital-Iraq 384
Imad Hadi Hameed, Israa Adnan Ibraheam, Fakhir Daffa Fakhir

Detoxifying of Nicotine in Smoker with Consumption of Food Containing CYP 2A6 Enzyme from Beef Liver

Abdul Rohim Tualeka¹, Siti Rahayu Nadhiroh²

¹Department of Occupational Health and Safety, ²Department of Nutrition, School of Public Health, Airlangga University, Indonesia

ABSTRACT

Background: the addicted smoking nicotine levels in the blood have an average 12 mg/liter of blood, while the safe limit of nicotine in the blood is 2 mg/liter. Nicotine levels decreased can be done by using the food contains biotransformation enzymes i.e. CYP 2A6. The purpose of this study was to know the decrease in nicotine in the blood of smokers after the feeding of biotransformation enzyme containing nicotine CYP 2A6

Method: The research method was an experiment. The number of respondents active smokers 30 people which received rehabilitation at PHC Surabaya Hospital. Samples were taken by random sampling.

Result: Based on the results of the study, second inspection after consumption of food which contained enzyme CYP 2A6 from beef liver, there was an increased excretion of cotinine in urine. There were 80% of respondents have increased levels excretion of cotinine in urine.

Conclusion: The conclusion of this study was that food which contained nicotine biotransformation enzyme (CYP 2A6) decreased concentration of nicotine in the blood of smokers

Keywords: Nicotine, Detoxification, CYP 2A6 enzyme, Cotinine, Biotransformation

INTRODUCTION

Nicotine is the main cause of addiction in smoking making smokers will continue to smoke^{1,2,3}. The more often the smoking then the health impact arising diseases will be even greater. Disease control can be done by reducing and eliminating nicotine from the body of the smoker. The efforts are made by biotransformation of nicotine in the body⁴.

Metabolism of nicotine in the body was various, although the main route of nicotine metabolism is through cotinine (70-80%). Biotransformation of nicotine is undertaken by the enzyme cytochrome P-450

(CYP 2A6) to become cotinine, biotransformation by the enzyme N-flavoprotein can be nicotine oxidase, biotransformation by glucuronate (UGT) becomes cotinine glucuronate so that the consumption of nicotine in the urine be found cotinine, nicotine, nicotine oxidase N-glucuronate and nicotine itself^{5,6}.

Biotransformation process nicotine is change by CYP 2A6 is 75% cotinine, 8-10% nicotine glucuronide, nicotine N-oxide is 3-5%. When it's adding around 99.5% so enzymes that play a role in detoxifying nicotine is a Cytochrome P-450 CYP 2A6-, glucuronate, methylation, flavoprotein, and glutathione⁷.

Based on research before, foods contained ingredients for biotransformation such as^{8,9}:

a. P 450 (CYP-2A6) cytochrome: vegetables and meat contained iron

Many foods contained iron have easily obtained ingredients. The food spread has ranged from vegetables, fruits, until the meat. Examples of foods that

Corresponding author

Abdul Rohim Tualeka

Occupational Health and Safety Department, School of Public Health, Airlangga University

Kampus C, Jalan Mulyorejo, Surabaya, 60115,

Indonesia, Tel: +62 31 5920948, Fax: +62 31 5924618

E-mail: inzut.tualeka@gmail.com

contain iron included potato peels, spinach, kale, corn, chard, Beet Greens, fruit apricots, citrus fruits, peanuts, green beans, soybeans, raisins, cereal, eggs, fish, and beef.

b. Flavoprotein : green tea, soy, hemp trunks arbei.

c. Glucuronate: cauliflower, broccoli, cabbage, celery, sprouts, apples, cherries, avocado .

Based on results of the other research, CYP 2A6 enzyme has an important role for change nicotine to cotinine¹⁰. This research has incorporated also with a relationship of metabolism of nicotine with immunodetectable hepatic CYP 2A6 (within = 31 human livers) and research on immuno-inhibition. Those research more to research experimentation by making use of culture in vitro and in vivo.

Other research also tends to be associated with this type of polymorphism of the enzyme CYP 2A6 such as of CYP2A6 * 4. These allele types are believed to have ties with the smoking behavior even research according to result of Rao Y. et al research stated that the number of cigarettes that consumed per day with the CYP2A6 * 4 alleles less on someone who does not have the CYP2A6 *¹¹ .

Based on research in Japan, found that in the Japanese and Koreans, the formation of cotinine in the body will be reduced because of this allele (CYP2A6 * 4) may inhibit the metabolism of nicotine¹².

Previous research was still associated genetic relationship such as polymorphism CYP 2A6 type with the smoking behavior of the smoker and seldom to explain how to reduce nicotine level in workers blood. But other research stated that decrease levels of nicotine in the body of the smoker can be using a food contains biotransformator enzymes i.e. CYP2A6 with nicotine level in the blood i.e. 2 mg/L in blood (for smoker, nicotine in blood averages 12 mg/liter)¹³. But, this research still requires other research evidence. So, it is needed to research on the relationship of foods consumption containing CYP 2A6 enzyme from the liver of beef with decrease level of nicotine.

The study will assess to know the decrease in nicotine in the blood of smokers after the feeding food containing nicotine biotransformation enzyme (CYP2A6).

MATERIAL AND METHOD

This study used experiment method. This experiment such as giving food containing P-450 (CYP 2A6) cytochrome.

Research conducted in experimental against smokers. Smokers are fed every day 3 times, i.e., morning, noon and night. Feeding for 6 days. The given food contains cytochrome P-450. Consecutive meals to be provided are: spinach, corn, kale, chard, beet greens, apricots, oranges, peanuts, green beans, soybeans, raisins, cereal, eggs, fish, and beef, green tea, soy, hemp trunks arbei, cauliflower, broccoli, cabbage, celery, sprouts, apples, cherries, avocado. The types of food that are made in the form of vegetables and fish and milk with the same weight on each of the respondents.

Before feeding on day one, firstly, measured the levels of nicotine in the urine. After feeding the sixth-day smokers also measured the levels of nicotine in the urine, and also the nicotine glucuronate, nicotine N-oxides, and cotinine.

The number of respondents as many as 30 people active smokers who got treatment at the rehab place smoker in PHC hospital Surabaya. Samples were taken in random sampling. Independent variables were the mass of the enzyme cytochrome P450 enzymes i.e. biotransformator or PYC 2A6 with units of mg/liter. Dependent variables were nicotine levels and cotinine in the urine with units of mg/l. Nicotine and cotinine in the urine measured by QRMA (Quantum Resonance Magnetic Analyzer). To test the difference in the levels of nicotine and cotinine in the urine before and after the awarding of the food contains biotransformator of nicotine on smokers used t-test are not paired.

FINDINGS/RESULT

Table 1 Distribution of Respondent Smoking Habit

Smoking Habit	Quantity	Percentage
Smoking	20	100 %
No Smoking Habit	0	0 %
Total	20	100.00 %

Based

the

above table shows that all respondents have a smoking habit

Tabel 2. Distribution of Respondent First Age Smoking

First Time Smoking	Quantity	Percentage
Elementary school (6-13 years old)	5	25,00 %
Junior high school (14-16 years old)	5	25,00 %
Senior high school (17-19 years old)	8	40,00 %
Recently	1	5,00 %
Other	1	5,00%
Total	20	100.00 %

Based on the table above shows that the distribution of the first age respondents do smoking is since senior high school during of 17-19 years old with the percentage of 40.00%.

Tabel 3. Distribution of Smoking duration

Duration smoking	Quantity	Percentage
1-20 years	9	45,00 %
11-20 years	3	15,00 %
>20 years	8	40,00 %
Total	20	100.00 %

Based on the table above shows that most respondents smoking during 1-20 years old with the latest smoking is 2 years old.

Tabel 4: The Amount Spent on Cigarettes

The number of cigarettes that is spent every day	Quantity	Percentage
1-10 cigarettes	15	75,00 %
11-20 cigarettes	2	10,00 %
21-30 cigarettes	2	10,00 %
Other	1	5,00 %
Total	20	100.00 %

Based on the above table shows that the majority of the respondents spent smoking as much as 1-10 cigarettes per day with the percentage of 75%

The Result of Cotinine Examination

Tabel 5 Result of Before and After Cotinine Examination

ID Responden	Hasil Pemeriksaan 1	Hasil Pemeriksaan 2
1	529.95	3143
2	1314.73	475
3	2624.88	3484
4	441.61	1690
5	934.35	446
6	520.37	1111
7	2776.52	4224
8	1258.12	2310
9	400.64	3236
10	84.44	469

(Source: Primary Data, 2016)

Table above shows that the results of the examination of the second against respondents after the giving of food contain CYP 2A6 enzyme, glucuronate, and flavoprotein, there is an increase in cotinine level in the urine. There are 8 respondents occurred increased levels of cotinine in the urine while 2 respondents experienced a decrease in the levels of cotinine.

DISCUSSION

Smoking Habit

The results showed that 100.00% of the respondents have a habit of smoking. This shows that someone who smoked did not immediately feel the consequences that arise from the harm of smoking. Based on Susenas data in 2001, stated the prevalence of former male smokers and women relative small at such a young age, this can be attributed to the effects of smoking that occurred approximately 20 years. This situation can be seen in people who have quit smoking mostly in the elderly.

Distribution of Respondent First Age Smoking

Results of the study stated the largest percentage the distribution first age smoking is since senior

high school during 17-19 years old. This suggests that this age is the age of teenagers with high a sense of curiosity is high, including trying to smoke.

Data Riskesdas and Health Research Agencies noted that the trend of the age of smoke rises in the age of the adolescents in the age group 10-14 years and 15-19 years of age. Results of data Riskesdas in the year 2007, 2010 and 2013, shows that the highest number of age start smoking at age group 15-17 years.

According to the Smet explained the age of first smoking generally ranges between 11-13 years. It can be said that someone started smoking at a time when children or teens. In general, according to Kurt Lewin, the smoking behavior is affected by individual factors and environmental factors¹⁴. Individual factors coming from within a teenager. Teenagers start smoking is associated with the presence of psychosocial crisis during its development namely “ identity search”. In this time the teen feels there is a mismatch between social development with a psychic. Teenagers will know that efforts to find an identity, not all correspond to the environment.

Duration and The Amount Spent on Cigarettes

A majority of respondents have smoked for a long-range 1-20 years. The reasons respondents liked the smoke can be a pleasant feeling of smoking, reducing anxiety, anger, and agitation. While the distribution of cigarettes spent 10-20 pieces per day. This shows that smoking can cause addiction and create a habit for users.

The Result of Cotinine Examination

Results of the study stated the presence of increased levels of cotinine in the urine of second inspection results against respondents after the giving of food contain CYP 2A6 enzyme, 8 respondents occurred increased levels of cotinine with a percentage of 80%. This shows that the nicotine has been converted into a form of cotinine have been expelled through the urine. Cotinine issued through the urine can reduce the levels of nicotine in the body of the respondents, so the level of dependency against nicotine can be reduced.

While the test of Paired t-test produces showed that significance $0.028 < 0,005$, then H_0 is rejected. So,

there is relation between decline nicotine level in the blood against the giving of food containing CYP 2A6 enzyme.

CONCLUSION

The characteristics of the respondents such as smoking habit, first age smoking, duration and amount spent of cigarettes affects a decrease of concentration of nicotine in the blood of smokers after feeding food containing nicotine biotransformator enzyme (CYP 2A6), and there is a relation between decrease concentration of nicotine in the blood of smokers after feeding food containing nicotine biotransformator enzyme CYP 2A6

RECOMMENDATION

Further research is needed, especially in involving the nicotine detoxification by using food that is nutritious. Awareness is also needed for a healthy living mainly by involving family support nearby to reduce the consumption of cigarettes and cultivate a nutritious food ingredient.

Conflict of Interest: All authors have no conflicts of interest to declare.

Source of Funding: This is an article “Detoxifying Of Nicotine In Smokers with Consumption Of Food Containing CYP 2A6 Enzyme from Beef Liver ” that was supported by Faculty of Public Health, Airlangga University, Indonesia, 2017.

Ethical Clearance: Ethical Clearance taken from Faculty of Public Health, Airlangga University, Indonesia Comitte

REFERENCES

- [1] Nurhayati, Isnani. Bahaya Rokok Bagi Tubuh (Telaah Pustaka).”Jurnal Keperawatan eM-U 4.12 (2014).
- [2] Kusuma, Dani Ali, Sudarminto S. Yuwono, and Siti Narsito Wulan. “Studi kadar nikotin dan tar sembilan merk rokok kretek filter yang Beredar di wilayah kabupaten Nganjuk.” Jurnal Teknologi Pertanian 5.3 (2012).
- [3] Pradipta, Tito. Hubungan antara kebiasaan merokok dengan stroke hemoragik berdasarkan pemeriksaan ct-scan kepala. Diss. UNIVERSITAS SEBELAS MARET, 2010.

- [4] Susanna, Dewi, Budi Hartono, and Hendra Fauzan. "Penentuan kadar nikotin dalam asap rokok." *Jurnal Kesehatan* 7.2 (2003).
- [5] Suwardi, H., Aditia, F. K., & Wijaya, L. (2011). Peran Nikotin Rokok pada Patogenesis Psoriasis. *Damianus Journal of Medicine*, 10(2), 86-90.
- [6] Williams.P. *Industrial Toxicology*.Van Nostrand Reinhold.New York.(1980)
- [7] Hayes.A.W. *Principles and Methods of Toxicology*.Informa Healthcare.USA (2007)
- [8] Slaga.T.*The Detox Revolution*.PT.Bhuana Ilmu Populer.Kelompok Agramedia.Jakarta (2005)
- [9] Toruan P. *Anti aging Alami*.Materi Seminar dan Pelatihan.Surabaya.(2015)
- [10] Messina ES, Tyndale RF, Sellers EM. A major role for CYP2A6 in Nicotine C-oxidation by human liver microsomes. *J Pharmacol Exp Ther.* 1997 Sep;282(3):1608-14
- [11] Rao Y, Hoffmann E, Zia M, et al. Duplications and defects in the CYP2A6 gene identification, genotyping, and in vivo effects on smoking. *Mol Pharmacol*, 58: 747-755, 2000.
- [12] Yamanaka H, Nakajima M, Nishimura K, Yoshida R, Fukami T, Katoh M, et al. Metabolic profile of nicotine in subjects whose CYP2A6 gene is deleted. *Europ J Pharmaceut Sc.* 2004; 22:419-42.
- [13] Dale S.Canon. CYP 2A6 Longitudinal Effects in Young Smokers. *Journal Nicotine Tob Res* (2016) 18 (2): 196-203 doi:10.1093/ntr/ntv049. New York.
- [14] Smet, B. *Psikologi Kesehatan*. Semarang: PT. Gramedia. 1994.
- [15] Tualeka.A.R. *Makanan, Pengobatan Masa Depan*. Jawa Pos, 2000.
- [16] Tualeka.A.R. *Assosiasi Kebiasaan Merokok dengan Penyalahgunaan NAPZA*.Lemlit Unair. Surabaya 2000.
- [17] Tualeka,A.R. *Toksikologi Industri*.Graha Ilmu Mulia.Surabaya. 2014.
- [18] Tualeka,A.R. *Toksikologi Industri dan Risk Assessment Logam Berat*.Graha ilmu Mulia. Surabaya 2015.