

Smoking, a cause of unsuccessful aging

¹Valer Donca, ²Dan Rădulescu, ¹Antonia Macarie, ²Elena Buzdugan,
¹Luminița Pașca, and ³Adela M. Șerban

¹ Department of Geriatrics and Gerontology, 5th Medical Clinic, "Iuliu Hațieganu" University of Medicine and Pharmacy, Cluj-Napoca, Cluj, România; ² Department of Internal Medicine, 5th Medical Clinic, "Iuliu Hațieganu" University of Medicine and Pharmacy, Cluj-Napoca, Cluj, România; ³ Department of Cardiology, Heart Institute "Niculae Stăncioiu", "Iuliu Hațieganu" University of Medicine and Pharmacy, Cluj-Napoca, Cluj, România. Corresponding author: V. Donca, valerdonca@gmail.com

Abstract. Smoking in elderly is still a frequent phenomenon and it represents a significant cause of morbidity and mortality. Smoking is also an important cause of acceleration of processes that accompany physiological aging. Both elements are directly responsible for the so-called unsuccessful aging. Although smoking cessation, even at an advanced age, has beneficial effects, smoking cessation counseling of elderly may be a real challenge for doctors. The use of therapeutic means that have demonstrated their efficacy in adult population can be, with certain reserves, a viable alternative for smoking cessation in the elderly.

Key Words: elderly, smoking, aging.

Introduction. Successful aging is defined as the capacity of maintaining a low risk of disease or disability, a superior functional physical and mental capacity, as well as the presence of a strong motivation to live (Rowe & Kahn 1998). Smoking has been described as a pediatric disease, because although morbidity and mortality from smoking manifest at adult and old age, they have their origin in childhood (Kessler 2001). Smoking is one of the main causes of morbidity and mortality, and is even considered the most important preventable cause of death (Smith & Fiore 1999).

Smoking and elderly. The relationship between smoking and mortality is well known. Moreover, a prospective 10-year study on more than 2000 elderly subjects, aiming to evidence the main death factors, has concluded that age, smoking and increased heart rate are the most significant predictive factors for mortality of any cause (Menotti et al 2001). The prevalence of smoking has increased progressively since the beginning of the 20th century, with the highest increase occurring after World War II and reaching a plateau in the '60-70s. In addition, the onset period of smoking in the elderly (adolescence and maturity) was marked by social acceptance of this phenomenon. At that time, smoking was widely promoted by the media, for its "beneficial" effects on mood state, weight control, and social status. The elderly of today started smoking at a time when the harmful effects of smoking were not known (American Lung Association 2004).

Until 1969, elderly people in care centers received free cigarettes on the occasion of the celebration of the „Respect for the Aged” Day (a national Japanese holiday celebrated on 15 September). In 1964, the first Surgeon General’s Report was published, which associated smoking with bronchopulmonary cancer (History of the Surgeon General's Report on Smoking and Health 2007). In spite of this, in the same year, American Medical Association supported the objection of the tobacco industry to labeling the packs of cigarettes as being dangerous to health, arguing that there was insufficient

scientific evidence to demonstrate the relationship between smoking and bronchopulmonary cancer. Although the number of elderly smokers has decreased since the mid-20th century to the present, this represents, at least in USA, approximately 27% of all smokers, the proportion of smokers older than 65 years being 10.6%. Of the more than 430000 death cases from smoking in USA, more than 94% are people aged over 50 years; more than 70% are people aged over 65 years (Fact sheet on tobacco & older persons 2001).

What are the effects of smoking? The effects of smoking vary from one person to another and generally depend on individual susceptibility to chemical substances from the cigarette smoke, on the number of cigarettes smoked per day, on the smoking onset age and on the number of years of smoking.

The immediate effects of smoking are represented by an increase in blood pressure and heart rate and a decrease in peripheral blood flow, a stimulation of cerebral activity for a short time period, followed by its reduction; other manifestations are dizziness, nausea, lacrimation and increased gastric secretion, as well as a reduction of appetite and taste and smell sensitivity (Australian Drug Foundation 2002).

In the long term, the effects of smoking are multiple. The incidence of respiratory infections and chronic obstructive pulmonary disease (COPD) as well as mortality from these increases with the number of cigarettes smoked and the duration of smoking (Sethi & Rochester 2000). Pulmonary function, most easily measured by the determination of forced expiratory volume in 1 second (FEV1), decreases with age even in non-smokers, but these generally have sufficient functional pulmonary reserves so that the activities of their daily living (ADL) are not significantly affected. Cardiovascular diseases (cerebrovascular accidents, coronary and peripheral vascular ischemic disease) are directly related to smoking in the general population.

However, in the elderly, smoking has not been proved to be a major risk factor of coronary events in men or women. Nevertheless, a significant association has been found between smoking and mortality from cardiovascular diseases (Cupples & D'Agostino 1987). This phenomenon could be explained by the fact that smoking is more closely correlated with lethal events than with combined morbid and lethal events. Another explanation might be that great smokers who quit smoking have been labeled as non-smokers, reducing in this way the strength of the association between the risk factor and the result (Cupples et al 1998).

Cancer is among the first nosological entities whose etiology has been associated with smoking. The first studies carried out in the '50-60s focused on lung cancer, the incidence of lung and laryngeal cancer being higher in smokers. After the publication of the first Surgeon General's Report in 1964, the list of smoking-related diseases extended, including neoplasms of the majority of organs. The incidence of bronchopulmonary, laryngeal, renal, pancreatic and gastric neoplasms is higher in smokers (Australian Drug Foundation 2002). Bronchopulmonary cancer is a geriatric disease; 50% of all cases occur in people aged over 65 years (Greenberg et al 1984).

The prevalence and the severity of the erectile function increase with aging, men in the 5th decade of life having a three-fold risk of this disease compared to those in the 2nd decade of life. At 65 years of age, 25% of men have sexual dysfunction, and the proportion increases to 55% at 75 years and 65% at 80 years (Joyce 2000). The causes of erectile dysfunction are organic and psychogenic; among organic causes, which are the most frequent, diabetes mellitus, drugs interfering with the central neuroendocrine and local neurovascular control of penile smooth muscles, as well as the use of toxic substances: tobacco, alcohol, should be mentioned. Smoking is an independent risk factor for erectile dysfunction. Massachusetts Male Aging Study has showed a 41% risk of erectile dysfunction in smokers, compared to only 14% in non-smokers (Feldman et al 1994). Other studies have demonstrated that 81% of elderly smokers or former smokers have sexual dynamic disorders (Monga 1999). Skin aging, particularly the appearance of

wrinkles, occurs earlier in smokers, who look older than non-smokers of the same age (Australian Drug Foundation 2002).

Other nosological entities characteristic of advanced age, whose incidence and prevalence is influenced by smoking, with which a direct causal relationship has been established, were published in the 28th Surgeon General's Report in 2004: cataract, femoral neck fractures, osteoporosis. It is not without importance that the elderly are models for younger generations. Children living with smoking adults or elderly have a higher risk of becoming smokers in their turn. So, by smoking, the elderly can contribute to the health problems of the future generations.

Smoking cessation. The „Stages of Change“ model represents an important tool for the evaluation of the wish and the capacity of an individual to quit smoking. This model includes five motivational stages: (1) precontemplation (no plan to quit smoking in the next 6 months), (2) contemplation (consideration of quitting smoking in the next 6 months), (3) preparation (consideration of quitting smoking in the next 30 days), (4) action (successful smoking cessation for less than 6 months) and (5) maintenance (successful smoking cessation for at least 6 months) (Okuyemi et al 2006). Elderly smokers are more frequently found at the precontemplation stage. An elderly smoker is less likely to quit smoking than a young smoker, but on the other hand, an elderly smoker who aims to give up smoking is much more likely to succeed in doing so than a young smoker (Burns 2000). Smoking cessation counseling is recommended at each medical visit of a smoking patient. Counseling is particularly important in the case of the elderly, as long as they keep smoking due to nicotine addiction rather than psychosocial factors (Appel 2003).

Pharmacotherapy of smoking cessation. According to the recommendations of the USA Public Health Service, nicotine replacement therapy and Bupropion SR represent the first therapeutic line in the pharmacotherapy of smoking cessation. Clonidine and Nortriptyline are the second choice. Although nicotine replacement therapy, regardless of the administration modality, proved to be effective compared to placebo therapy in the studied population, data on the elderly are limited (West et al 2001). The negative effects of nicotine replacement therapy include palpitations, cephalgia and hypertension, which is why this therapeutic method should be recommended with caution in the elderly. Bupropion SR is an antidepressant whose mechanism of action in smoking cessation is not known, but it is supposed to be related to a noradrenergic /dopaminergic system (Henningfield et al 2005). Bupropion SR has proved its efficacy in the treatment of smoking cessation and nicotine addiction in both men and women (Scharf & Shiffman 2004). In addition, in a study monitoring the predictors of successful smoking cessation, advanced age was reported to be one of these predictors (Dale et al 2001). Regarding tolerability, Bupropion SR has been used as an antidepressant in the elderly for a long time and has proved to be well tolerated in this population group.

References

- Appel D. W., Aldrich T. K., 2003 Smoking cessation in the elderly. *Clin Geriatr Med* **19**(1):77-100.
- Burns D. M., 2000 Cigarette smoking among the elderly: Disease consequences and the benefits of cessation. *Am J Health Promot* **14**(6):357-361.
- Cupples L. A. & D'Agostino R. B., 1987 Some risk factors related to the annual incidence of cardiovascular disease and death using pooled repeated biennial measurements: Framingham Heart Study, 30-year follow up. In: *The Framingham Heart Study: An Epidemiological Investigation of Cardiovascular Disease*. Kannel W. B., Wolf P. A. (eds), MD: National heart, Lung, and Blood Institute publications No. (NIH) 87-703, Bethesda.

- Cupples L. A., D'Agostino R. B., Anderson K., Kannel W.B., 1998 Comparison of baseline and repeated measure covariate techniques in the Framingham Heart Study. *Stat Med* **7**(1-2):205-222.
- Dale L. C., Glover E. D., Sachs D. P., Schroeder D. R., Offord K. P., Croghan I. T., Hurt R. D., 2001 Bupropion for smoking cessation: Predictors of successful outcome. *Chest* **119**:1357-1364.
- DasGupta K., 1998 Treatment of depression in elderly patients: Recent advances. *Arch Fam Med* **7**(3):274-280.
- Feldman H. A., Goldstein I., Hatzichristou D. G., Krane R. J., McKinlay J. B., 1994 Impotence and its medical and psychosocial correlates: results of the Massachusetts male aging study. *J Urol* **151**:54-61.
- Greenberg E. R., Korson R., Baker J., Barrett J., Baron J. A., Yates J., 1984 Incidence of lung cancer by cell type: a population based study in New Hampshire and Vermont. *J Natl Cancer Inst* **72**:599-603.
- Henningfield J. E., Fant R. V., Buchhalter A. R., Stitzer M. L., 2005 Pharmacotherapy for nicotine dependence. *CA Cancer J Clin* **55**(5):281-299.
- Joyce S., 2000 Psychogenic & Organic Causes of Erectile Dysfunction: Part I. *Geriatrics and Aging* **3**(3):4-14.
- Kessler D. A., 2001 A question of intent: a great American battle with a deadly industry. PublicAffairs, New York.
- Menotti A., Mulder I., Nissinen A., Feskens E., Giampaoli S., Tervahauta M., Kromhout D., 2001 Cardiovascular risk factors and 10 year all-cause mortality in elderly European male populations. *Eur Heart J* **22**:573-9.
- Monga M., 1999 The aging penis: Erectile dysfunction. *Geriatr Nephrol Urol* **9**:27-37.
- Okuyemi K. S., Nollen N. L., Ahluwalia J. S., 2006 Interventions to facilitate smoking cessation. *Am Fam Physician* **74**:262-271.
- Rowe J. W. & Kahn R. L., 1998 *Successful Aging*. Pantheon Books, New York.
- Scharf D. & Shiffman S., 2004 Are there gender differences in smoking cessation, with and without bupropion? Pooled- and meta-analyses of clinical trials of bupropion SR. *Addiction* **99**:1462-1469.
- Sethi J. M. & Rochester C. L., 2000 Smoking and chronic obstructive pulmonary disease. *Clin Chest Med* **21**:67-86.
- Smith S. S. & Fiore M. C., 1999 The epidemiology of tobacco use, dependence, and cessation in the United States. *Prim Care* **26**:433-61.
- West R., Hajek P., Nilsson F., Foulds J., May S., Meadows A., 2001 Individual differences in preferences for and responses to four nicotine replacement products. *Psychopharmacology (Berl)* **153**(2):225-230.
- ***American Lung Association. Smoking Among Older Adults [Online] 2004. Available at: http://www.public-health.uiowa.edu/itrc/quitline/Quitline_PDFs/Smoking_Older_Adults_PDF.pdf.
- ***Australian Drug Foundation. What are the effects of smoking? [Online] 2002. Available at: <http://www.mydr.com.au/default.asp?article=2907>.
- ***Fact sheet on tobacco & older persons [Online] 2001. Available at: <http://www.tcsg.org/tobacco/facts.htm>.
- ***History of the Surgeon General's Report on Smoking and Health [Online] 2007. Available at: http://www.cdc.gov/tobacco/data_statistics/sgr/history.htm.
- ***Treating Tobacco Use and Dependence. Quick Reference Guide for Clinicians, 2000. U.S. Public Health Service. Available at: <http://www.surgeongeneral.gov/tobacco/tobaqrg.htm>.
- ***U.S. Department of Health and Human Services. The Health Consequences of Smoking: A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2004. Available at: <http://www.surgeongeneral.gov/library/smokingconsequences>.

Received: 2 October 2011. Accepted: 3 November 2011. Published online: 6 November 2011.

Authors:

Valer Donca, Department of Geriatrics and Gerontology, 5th Medical Clinic, "Iuliu Hațieganu" University of Medicine and Pharmacy, 11th Tăbăcarilor Street, 400139, Cluj-Napoca, Romania, EU, email: valerdonca@gmail.com.

Dan Rădulescu, Department of Internal Medicine, 5th Medical Clinic, "Iuliu Hațieganu" University of Medicine and Pharmacy, 11th Tăbăcarilor Street, 400139, Cluj-Napoca, România, EU, email: dan_rad31@yahoo.com.

Antonia Macarie, Department of Geriatrics and Gerontology, 5th Medical Clinic, "Iuliu Hațieganu" University of Medicine and Pharmacy, 11th Tăbăcarilor Street, 400139, Cluj-Napoca, Romania, EU, email: macarieantonia@yahoo.com.

Elena Buzdugan, Department of Internal Medicine, 5th Medical Clinic, "Iuliu Hațieganu" University of Medicine and Pharmacy, 11th Tăbăcarilor Street, 400139, Cluj-Napoca, România, EU, email: buzelena@yahoo.com.

Luminița Pașca, Department of Geriatrics and Gerontology, 5th Medical Clinic, "Iuliu Hațieganu" University of Medicine and Pharmacy, 11th Tăbăcarilor Street, 400139, Cluj-Napoca, Romania, EU, email: cul_mi@yahoo.com.

Adela Mihaela Șerban, Department of Cardiology, Heart Institute "Niculae Stancioiu", "Iuliu Hațieganu" University of Medicine and Pharmacy, 19-21st Moșilor Street, Cluj-Napoca, Cluj, România, EU, email: adelamserban@yahoo.com.

How to cite this article:

Donca V., Rădulescu D., Macarie A., Buzdugan E., Pașca L., Șerban A. M., 2011 Smoking, a cause of unsuccessful aging. HVM Bioflux **3**(3):227-231.