BULGARIAN MEDICINE ISSN 1314-3387

Българска медицина

Съдържание

Обзори

Оригинални статии

Corrigendum

Изисквания към авторите

Българска медицина се реферира
в международната база данни Index Copernicus International

Bulgarian medicine

Content

Reviews

Original papers

Corrigendum

Author's guidelines

Bulgarian Medicine is included in
Index Copernicus International Journals Master List

Prevention of gastric cancer

Miglena Stamboliyska,
Clinic of Gastroenterology, St. Marina University Hospital of Varna

Профилактика на стомашния рак

Миглена Стамболийска,
Клиника по гастроентерология, УМБАЛ Св. Марина – Варна.

РЕЗЮМЕ

Стомашният рак постоянно заема лидерско място сред онкологичните заболявания в света и нараства медицинското и социално- икономическото му значение. Неговата етиология включва: инфекция с хеликобактер пилори, диета, начин на живот, вредни навици като тютюнопушене и алкохолна консумация, генетична предиспозиция и фактори на околната среда. Прекомерната алкохолна консумация, прекалената солна консумация, нездравословния начин на живот, интензивно тютюнопушене, генетични дефекти, билиарния рефлукс, понижение на солно- киселата секреция и пепсиногенния статус, принадлежат към най-важните рискови фактори за тази патология. Главни преканцерозни състояния са: атрофичен гастрит, интестинална метаплазия, дисплазия, аденоматозния полип, стомашна язва с дисплазия. Съвременните превантивни стратегии се състоят от ерадикация на инфекцията с хеликобактер пилори, мониториране на пациентите с преканцерози и след провеждане на ерадикацията, регулярен ендоскопски контрол, химиопрофилактика с аспирин и нестероидни противовъзпалителни средства, консумация на пресни зеленчуци и плодове, ваксинации срещу инфекции, свърза-

ABSTRACT

Gastric cancer (GC) steadily occupies a leading position among oncological diseases worldwide and is of rising medical and socio-economic importance. Its etiology includes *Helicobacter pylori* (*H. pylori*)-infection, diet, life-style, tobacco smoking, alcohol consumption, genetic susceptibility and environmental risk factors. Heavy alcohol consumption, salt overconsumption, intensive tobacco smoking, non-healthy life-style, genetic defects and predisposition, bile reflux, reduced salt-acid secretion and pepsinogen status belong to the most important risk factors for this pathology. The main precanceroses are the following: atrophic gastritis, intestinal metaplasia, adenomatous polyp, dysplasia and gastric ulcer with dysplasia. Modern prevention strategies consist of the eradication of *H-pylori*-infection, monitoring of patients with precanceroses as well as after eradication of *H. pylori*-infection, regular endoscopic control, therapy with aspirin and NSAIDs, consumption of fresh vegetables and fruits, vaccination against infections with gastric cancer-related agents, serological assessment of gastric mucosal abnormalities, identification and surveillance of high-risk individuals, and endoscopic mucosal resection for gastric dysplasia.

ни със стомашния рак. Провеждане на скринингово серопогично изследване за преценка на функционалното състояние на стомаха и откриване на стомашни лигавични нарушения. Идентифициране и наблюдение на високо рисковите индивиди и ендоскопска мукозна резекция за стомашна дисплазия.

Ключови думи: стомашен рак, рискови фактори, ранна диагноза, преканцерози, скрининг, превенция

Key words: gastric cancer, risk factors, early diagnosis, precanceroses, screening, prevention

SOCIAL EPIDEMIOLOGY OF GASTRIC CANCER

Gastric cancer (GC) steadily occupies a leading position among oncological diseases worldwide. It is the fourth most frequently occurring malignancy after lung, breast, and colorectal cancer, and the second most common cause of death from cancer worldwide. Recent epidemiological trials convincingly show the medical and socioeconomic importance of this fatal pathology. Age-standardized rate of GC is projected to fall by ≥1% per year in the United Kingdom (24). Concerning GC incidence, mortality and survival, there is a great variability across countries. Its burden is particularly increasing in developing countries. In the developed European countries, there is rising awareness of social inequalities as an important public health issue. GC incidence rates increase in less developed and economically transitioning countries because of adoption of unhealthy Western lifestyles such as tobacco smoking, physical inactivity and consumption of calorie-dense food. The proportion of new cancer cases diagnosed in these countries is projected to increase from about 56% of the world total in 2008 to more than 60% in 2030 because of the increasing trends in cancer rates along with expected increases in life expectancy and population growth (17).

In Bulgaria, the standardized prevalence rates of GC during the recent decade vary between 69.8 in 2001, 80.6 in 2007, and 74.4 per 100 000 inhabitants in 2010. GC mortality rate in 2010 reaches a total of 1273 deaths or 7.7% of all deaths thus coming third after the cancers of trachea, bronchus and lung and colon cancer.

ETIOLOGY AND RISK FACTORS

Etiology of GC includes *Helicobacter pylori* (*H. pylori*)-infection, diet, life-style, tobacco smoking, alcohol consumption, genetic susceptibility and environmental risk factors (6). This is a multifactorial disease and removing one factor does not prevent all cases (11). Carcinogenic risk is modified by strain-specific bacterial components, host responses and/or specific host-microbe interactions.

To the numerous risk factors for GC belong heavy alcohol consumption, salt overconsumption, intensive tobacco smoking, non-healthy life-style, genetic defects and predisposition, bile reflux, reduced salt-acid secretion and pepsinogen status.

H. PYLORI INFECTION – THE MAIN RISK FACTOR FOR GC

Until the discovery of *H. pylori*, the environmental agent triggering this sequence of events was unknown, however, factors such as a high dietary salt intake, bile reflux, and bacterial production of nitrites, from nitrogenous constituents in food, breaching the mucus barrier of the stomach were implicated (10). Already in 1994, the International Agency for Research on

Cancer (IARC) and the World Health Organization (WHO) designate *H. pylori* as a definite carcinogen for gastric cancer based on epidemiological data. There is association between *H. pylori*-infection and GC where 80% or more of *H. pylori*-infected persons would develop atrophic gastritis. According to the contemporary *H. pylori* paradigm, there is sufficient evidence that this infection plays a primary pathogenetic role in GC. *H. pylori*-infection is the most consistent and essential risk factor for GC in 70–95 % of all GC cases and the most common proven risk factor for human non-cardiac GC (21). In this respect, its elimination is the most promising strategy to reduce GC incidence rate. The effect of all nutritional components and environmental elements contributing to the development of GC is strictly dependent on *H. pylori*-infection. *H. pylori*-infection carries the same risk for the intestinal and diffuse histologic types of gastric cancer (21). Most gastric cancers of these two types arise from mucosa infected by *H. pylori*. *H. pylori*-infection acts as a chronic inflammatory stimulus inducing progression of gastritis to gastric atrophy and then to gastric cancer. Subsequently, credence to the theory that atrophy, intestinal metaplasia, and dysplasia are more common in *H. pylori*-positive individuals than in negative ones was lent (10). The relationship between *H. pylori*-infection and GC has repeatedly been proved in epidemiological, experimental, and clinical prospective studies.

A recent meta-analysis demonstrates a pooled relative risk (RR) for GC of 1.07 for alcohol drinkers and of 1.20 for heavy ones when compared for non-drinkers (35). The pooled RR estimates are higher for gastric non-cardia than for gastric cardia adenocarcinoma.

A strong association between salt intake and high salt taste sensitivity threshold score, on the one hand, and GC risk, on the other hand, is established within a hospital-based case-control study of 300 GC patients and 600 cancer-free controls interviewed with a structured, 80-item questionnaire (38). This risk is quantified in relation to dietary salt exposure in the year before the onset of symptoms through sodium intake by a food frequency questionnaire, main food items/groups contributing to dietary sodium intake, visual analogical scale for salt intake preference, and use of table salt and the importance of salt intake is supported (27).

Tobacco smoking is classified as a group-one carcinogen for GC by the WHO International Agency for Research on Cancer, indicating that sufficient evidence exists in humans. The effects of three promoter interleukin-10 polymorphisms (-1082A>G, -819T>C, and -592 A>C), *H. pylori*-infection, and tobacco smoking on the risk of intestinal-type non-cardia gastric cancer are examined in a case-control study (19). There are positive associations with such an increased risk only in *H. pylori*-positive subjects and current tobacco smokers.

The intake of total meat, red meat, and processed meat is significantly and positively associated with non-cardia GC rather than with gastric cardia cancer. On the other hand, cereal fibre intake is related with reduced GC risk (12). There is a strong and significant negative association between adherence to a traditional Mediterranean dietary pattern (high intake of fruit and vegetables, cereals, fish, olive oil, legumes, moderate intake of alcohol and low intake of meat and dairy products) and GC. GC risk is significantly and inversely associated with plasma prediagnostic circulating level of vitamin C, some carotenoids (b-cryptoxantin and zeaxantin) retinol and alpha-tocopherol (12).

Polymorphisms of the TLR2 and TLR4 genes are associated with an increased GC risk in Brazil (4). There is a significant association between insulin-like growth factor-1 gene polymorphisms and GC risk as well as a positive and dose-dependent association between the number of risk alleles and GC risk in Japan (9). The polymorphism of estrogen response element in gene promoter of TFF1, a cysteine-rich protein, relates with an increased susceptibility to GC (25). Polymorphisms of prostate stem cell antigen, T allele of rs2294008C>T and A allele of rs2976392G>A, are related with a higher risk

of both intestinal- and diffuse-type GC (28). Compared with the apurinic/apyrimidinic endonuclease-1 TT genotype, individuals with the variant TG/GG genotypes have a significantly increased GC risk, more pronounced among subgroups of subjects aged ≤60 years, males, ever tobacco smokers, and ever drinkers (13). Polymorphisms of ICAM-1 K469E can be a useful biomarker for identifying individuals with higher GC risk, predicting disease progression and guiding individualized treatment (34).

Gastric intestinal metaplasia caused by bile reflux is a precancerous gastric adenocarcinomal lesion related with cyclooxygenase-2 (COX-2) induction. The expression of COX-2, CDX1, SHP and CCAAT element-binding protein beta messenger RNA in human intestinal metaplasia lesions are significantly higher than in those associated with gastritis. Bile acids initiate lineage-addicted gastroesophageal tumourigenesis by suppressing the epidermal growth factor receptor-proto-oncogene AKT axis and induce intestinal metaplasia at the gastroesophageal junction by activating the lineage-specific differentiation program and the NF-kappa B-CDX2 axis. Bile acid reflux in patients with Barrett's esophagus may increase reactive oxygen species production and cell proliferation via activation of PI-PLC gamma-2, ERK2 MAP kinase, and NADPH oxidase NOX5-S, thereby contributing to cancerogenesis (14).

Delineated bacterial and host mediators augmenting GC risk among target infected populations at higher neoplastic risk are of research interest. This risk is higher in populations with greater prevalence of type 1 diabetes mellitus (RR of 1.60), suggesting an insulin-independent carcinogenic process, and that of mortality due to GC is higher in the patients with than in those without diabetes mellitus (RR of 1.62) (22).

Gastric precancerous conditions are associated with polymorphisms in the cytotoxin-associated gene A-related genes, in the genes involved in host immunity against *H. pylori*-infection, or of the genes essential for the development/differentiation of the gastric epithelial cells. Genetic epidemiological studies of these associations with such and other gene polymorphisms in various pathways like oxidative DNA damage repair provide useful evidence for individualized GC prevention. Polymorphisms in several genes increase the risk for GC development.

THE IMPORTANCE OF *H. PYLORI* ERADICATION

H. pylori eradication is one of the most promising preventive strategies in the fight against GC. Overall benefit of eradication therapy in preventing the subsequent GC development is 1.1 versus 1.7 for placebo. Pooled data of six studies followed for 4 to 10 years show a RR for GC after *H. pylori* eradication of 0.65. This treatment is more effective before preneoplastic conditions and in absent atrophic gastritis or intestinal metaplasia at baseline (21). It abolishes the inflammatory response. Besides it slows or even regresses atrophy. Gastric atrophy may be reversible in the corpus rather than in the antrum. There is, however, no effect on gastric intestinal metaplasia (40). The effects of *H. pylori* eradication and GC risk depend on the grade and extent of preneoplastic lesions such as atrophic gastritis and intestinal metaplasia at the time of eradication (40). The Japanese Society for Helicobacter Research recommends that *H. pylori*-infection should be treated by eradication therapy (1). There are absolute indications for this eradication in cases of high GC risk such as first degree relatives of family members with diagnosis of GC, patients with previous gastric operation prior to gastric neoplasia, MALT lymphoma, adenoma and cancer as well. In accordance to Maastricht 4 conssenssus (21) the successful H. pylori eradication is a chance for gastric cancer prevention

EARLY DIAGNOSIS OF PRECANCEROSES

There are five main preneoplastic lesions: atrophic gastritis, intestinal metaplasia, adenomatous polyp, dysplasia and gastric ulcer with dysplasia. The European Society of Gastrointestinal Endoscopy, the European Helicobacter

Study Group, the European Society of Pathology and the Sociedade Portuguesa de Endoscopia Digestiva develop evidence-based guidelines on the management of patients with precancerous conditions and lesions of the stomach (MAPS) (8). The first recognized precancerous histologic change in stomach is active chronic inflammation which may either persist as non-atrophic chronic gastritis (no gland loss), or advance to multifocal atrophic gastritis. The next steps are: intestinal metaplasia (first 'complete' and then 'incomplete') dysplasia, low-grade and high-grade dysplasia, equivalent to 'carcinoma in situ' (2). Chronic atrophic gastritis is an inflammatory condition characterized by the loss of gastric glandular structures which are replaced either by connective tissue (non-metaplastic atrophy), or by glandular structures inappropriate for location (meta-plastic atrophy). It relates with two different types of tumours: intestinal-type GC and type I gastric carcinoid (36).

There are statistically significant associations between ABO genotype and GC, atrophic gastritis, and *H. pylori*-infection. An increased GC risk is observed with addition of the A allele and a decreased one – with that of the B allele (26). Gastric juice prostaglandin E2 and peptide growth factors (epidermal growth factor and transforming growth factor α) are potential markers of chronic atrophic gastritis, intestinal metaplasia, and GC (5). Intestinal-type GC is usually accompanied by intestinal metaplasia and leads to cancer via dysplasia, and thus intestinal metaplasia is considered a dependable morphological marker for GC risk (3). Intestinal metaplasia increases GC risk by six-fold. It is detected in nearly one of every four patients undergoing upper endoscopy. Its prevalence rate is significantly higher in patients with *H. pylori*-infection, in first-degree relatives of GC patients, in tobacco smokers and it increases with patient's age (40).

The combined loss of expression of seven metaplasia biomarkers (MUC13, CDH17, OLFM4, KRT20, LGALS4, MUC5AC, and REG4) is considered an independent prognostic indicator in undifferentiated or stage II/III GC (33). The ectopic expression of CDX2 and villin may be involved in early-stage intestinal metaplasia and tumourigenesis in gastric cardia and villin expression may be regulated by CDX2 (37).

Yearly endoscopic control is justified in any intestinal metaplasia patients with at least one of these conditions: extension >20%; presence of incomplete type; first-degree relative of GC patients, and tobacco smokers (40). Adenomatous gastric polyps are sessile or pedunculated lesions that originate in the gastric epithelium or submucosa and protrude into the stomach lumen. Their malignant potential to GC depends on the histological type. Image enhancement endoscopy including magnifying observation with narrow-band imaging system and microscopic magnifying observation opens the possibility of optical biopsy for early GC diagnosis (18). Therefore, endoscopic control with histological examination is the gold standard for screening and surveillance.

The following preneoplastic high risk conditions require endoscopic follow-up: pernicious anaemia with type A autoimmune atrophic gastritis, histological and/or serological signs of subtotal or total atrophic gastritis with hypo- or achlorhydria, diagnosis/removal of gastric adenoma, regular follow-up in moderate to severe atrophy at two-three-year intervals and three-six-month ones for dysplasia as well as Barrett's esophagus with carditis.

SCREENING FOR GC

Nowadays, screening for GC risk uses the 'ABC method' through combined assay for serum anti-*H. pylori* IgG antibody titres and serum pepsinogen (PG) I and II levels. It is cost-effective in countries with high GC incidence rates. Risk stratification could enhance its cost-effectiveness in populations at moderate risk. Before *H. pylori* eradication, this examination reveals the following four risk groups: group A *H. pylori* (–)PG(–) or infection-free subjects; group B *H. pylori* (+) PG(–) or chronic atrophic gastritis free or mild; group C *H. pylori* (+)PG(+) or chronic atrophic gastritis, and group D *H. pylori* (–)PG(+) or severe chronic atrophic gastritis with extensive intesti-

nal metaplasia (23). The interval for screening by the ABC method does not need be yearly, and an interval of about five years is recommended. Besides endoscopic examination should be performed at least once every three years for group B, at least once every two years for group C, and annually for group D. Group A should be excluded from the examination (23). ABC screening for GC is, however, not applicable in an ageing Japanese population with high prevalence of atrophic gastritis and *H. pylori*-infection (30).

The annual endoscopic examination is the most common practical screening strategy for patients with atrophic gastritis and intestinal metaplasia in Korea (31). There is empirical evidence of improved cost efficiency of an endoscopic surveillance programme for GC in Singapore as economies of scale and self-learning are the most important mechanisms for cost reduction (39).

MODERN PREVENTION MEASURES

Early detection and diagnosis of gastric adenomatous polyposis and polypectomy in combination with *H. pylori* eradication and correction of significant risk factors could be an important part of promising GC prevention strategies (20). Serology-based tests as screening markers for preneoplastic gastric mucosal changes have the potential for the early detection of gastric mucosal changes with GC risk or for the identification of the patients who are at high risk that require a close clinical follow-up (29). However, usage of congo-red chromoendoscopy proves that GCs emerging after *H. pylori* eradication arise exclusively from non-acid-secreting areas (15). This is confirmed by the histological detection of sustained hyperproliferation and accumulation of p53 protein in these areas.

Aspirin and non-steroidal anti-inflammatory drugs (NSAIDs) could suppress GC growth and induce apoptosis in GC cell lines. It is biologically plausible that their clinical application has the potential to prevent GG. Primary prevention trials of aspirin in populations at high GC risk are warranted (10). However, trials of supplementation with vitamin C, beta-carotene, vitamin E, selenium, molybdenum, and antioxidants in GC prevention cancer show conflicting results (10). Two recent meta-analyses examine statin use and cancer. They identify one relevant randomized controlled trial demonstrating that RR of GC with statin use is of 1.0. Epidemiological studies suggest that such a usage is associated with a significant reduction in this RR of 0.59 (10). The evidence of the relationship between physical activity and GC risk can be applied to refine the public health recommendations on the type, dose and timing of physical activity required to reduce this risk. They are for 30–60 min of at least moderate-intensity activity for at least five days weekly. Obviously, intensive physical activity is an integral component of modern GC prevention programs.

Recently, a clinical case of a successful GC prevention has been reported in Bulgaria (32).

FUTURE PREVENTION TRENDS

Aspirin may decrease GC incidence rate by approximately 30%. AspECT (Aspirin and Esomeprazole Chemoprevention Trial) aims not only at preventing GC but also at decreasing gastric side effects by combining aspirin with potent acid-suppressing drugs. Aspirin could be the world's first proven chemopreventive agent (16). Endoscopic surveillance is still needed, especially in subjects at higher risk as their definition is the future challenge (11). Vaccination and screening among minority populations could be implemented against the infections with GC-related agents.

The most essential current prevention strategies include the following actions: eradication of *H-pylori*-infection, monitoring of patients with precanceroses as well as after eradication of *H. pylori*-infection, regular endoscopic control, administration of aspirin and NSAIDs, proper intake of fresh vegetables and fruits, vaccination against infections with GC-related agents, serological assessment of gastric mucosal abnormalities, identification and surveillance of high-risk individuals, and endoscopic mucosal resection for gastric dysplasia.

Advances in GC stem cell markers such as CD44, CD90, CD133 and Musashi-1 reveal novel information on tumour cell behaviour and disease progression implicated for therapeutics. Future studies could uncover the molecular mechanisms of chronic inflammation-mediated oncogenic transformation and provide options for effective GC prevention and intervention (7).

REFERENCES

1. Asaka, M., M. Kato, S. Takahashi, et al.; Japanese Society for Helicobacter Research. Guidelines for the Management of Helicobacter Pylori Infection in Japan: 2009 Revised Edition. Helicobacter, 15, 2010, 1, 1–20.
2. Correa, P., M. B. Piazuelo. The Gastric Precancerous Cascade. J. Dig. Dis., 13, 2012, 1, 2–9.
3. Corso, G., R. Seruca, F. Roviello. Gastric Cancer Carcinogenesis and Tumor Progression. Ann. Ital. Chir., 83, 2012, 3, 172–176.
4. de Oliveira, J. G., A. E. Silva. Polymorphisms of the TLR2 and TLR4 Genes Are Associated with Risk of Gastric Cancer in a Brazilian Population. World J. Gastroenterol., 18, 2012, 11, 1235–1242.
5. Dias, A., C. Garcia, M. Majewski, et al. Gastric Juice Prostaglandins and Peptide Growth Factors as Potential Markers of Chronic Atrophic Gastritis, Intestinal Metaplasia and Gastric Cancer: Their Potential Clinical Implications Based on This Pilot Study. Dig. Dis. Sci., 56, 2011, 11, 3220–3225.
6. Dikshit, R. P., G. Mathur, S. Mhatre, et al. Epidemiological Review of Gastric Cancer in India. Indian J. Med. Paediatr. Oncol., 32, 2011, 1, 3–11.
7. Ding, S. Z., P. Y. Zheng. Helicobacter Pylori Infection Induced Gastric Cancer; Advance in Gastric Stem Cell Research and the Remaining Challenges. Gut Pathog., 4, 2012, 1, 18. doi: 10.1186/1757–4749–4-18.
8. Dinis-Ribeiro, M., M. Areia, A. C. de Vries, et al.; MAPS Participants. Management of Precancerous Conditions and Lesions in the Stomach (MAPS): Guideline from the European Society of Gastrointestinal Endoscopy (ESGE), European Helicobacter Study Group (EHSG), European Society of Pathology (ESP), and the Sociedade Portuguesa de Endoscopia Digestiva (SPED). Endoscopy, 44, 2012, 1, 74–94.
9. Ennishi, D., K. Shitara, H. Ito, et al. Association between Insulin-like Growth Factor-1 Polymorphisms and Stomach Cancer Risk in a Japanese Population. Cancer Sci., 102, 2011, 12, 2231–2235.
10. Ford, A. C. Chemoprevention for Gastric Cancer. Best Pract. Res. Clin. Gastroenterol., 25, 2011, 4–5, 581–592.
11. Fuccio, L., L. H. Eusebi, F. Bazzoli. Gastric Cancer, Helicobacter Pylori Infection and Other Risk Factors. World J. Gastrointest. Oncol., 2, 2010, 9, 342–347.
12. Gonzalez, C. A., E. Riboli. Diet and Cancer Prevention: Contributions from the European Prospective Investigation into Cancer and Nutrition (EPIC) Study. Eur. J. Cancer, 46, 2010, 14, 2555–2562.
13. Gu, D., M. Wang, S. Wang, et al. The DNA Repair Gene APE1 T1349G Polymorphism and Risk of Gastric Cancer in a Chinese Population. PLoS One, 6, 2011, 12, e28971.
14. Hong, J., J. Behar, J. Wands, et al. Bile Acid Reflux Contributes to Development of Esophageal Adenocarcinoma via Activation of Phosphatidylinositol-specific Phospholipase C gamma2 and NADPH Oxidase NOX5-S. Cancer Res., 70, 2010, 3, 1247–1255.
15. Iijima, K., Y. Abe, T. Koike, et al. Gastric Cancers Emerging after H. Pylori Eradication Arise Exclusively from Non-acid-secreting Areas. Tohoku J. Exp. Med., 226, 2012, 1, 45–53.
16. Jankowska, H., P. Hooper, J. A. Jankowski. Aspirin Chemoprevention of Gastrointestinal Cancer in the Next Decade. A Review of the Evidence. Pol. Arch. Med. Wewn., 120, 2010, 10, 407–412.
17. Jemal, A., M. M. Center, C. DeSantis, et al. Global Patterns of Cancer Incidence and Mortality Rates and Trends. Cancer Epidemiol. Biomarkers Prev., 19, 2010, 8, 1893–1907.
18. Kato, M., M. Asaka. Recent Knowledge of the Relationship between Helicobacter Pylori and Gastric Cancer and Recent Progress of Gastroendoscopic Diagnosis and Treatment for Gastric Cancer. Jpn. J. Clin. Oncol., 40, 2010, 9, 828–837.
19. Kim, J., Y. A. Cho, I. J. Choi, et al. Effects of Interleukin-10 Polymorphisms, Helicobacter Pylori Infection, and Smoking on the Risk of Noncardia Gastric Cancer. PLoS One, 7, 2012, 1, e29643.
20. Kotzev, I., M. Stamboliyska, I. Shalev, et al. Risk and Protective Factors for the Development of Gastric Polyposis and Cancer.– Savr. Med., 2007, 2, 33–41 (in Bulgarian).
21. Malfertheiner, P., F. Megraud, C. A. O'Morain, et al.; European Helicobacter Study Group. Management of Helicobacter Pylori Infection – the Maastricht IV/Florence Consensus Report. Gut, 61, 2012, 5, 646–664.

22. Marimuthu, S. P., P. Vijayaragavan, K. B. Moysich, et al. Diabetes Mellitus and Gastric Carcinoma: Is There an Association? J. Carcinog., 10, 2011, 30. doi: 10.4103/1477–3163.9048.
23. Miki, K. Gastric Cancer Screening by Combined Assay for Serum Anti-Helicobacter Pylori IgG Antibody and Serum Pepsinogen Levels – "ABC Method". Proc. Jpn. Acad. Ser. B. Phys. Biol. Sci., 87, 2011, 7, 405–414.
24. Mistry, M., D. M. Parkin, A. S. Ahmad, et al. Cancer Incidence in the United Kingdom: Projections to the Year 2030. Br. J. Cancer, 105, 2011, 11, 1795–1803.
25. Moghanibashi, M., P. Mohamadynejad, M. Rasekhi, et al. Polymorphism of Estrogen Response Element in TFF1 Gene Promoter Is Associated with an Increased Susceptibility to Gastric Cancer. Gene, 492, 2012, 1, 100–103.
26. Nakao, M., K. Matsuo, H. Ito, et al. ABO Genotype and the Risk of Gastric Cancer, Atrophic Gastritis, and Helicobacter Pylori Infection. Cancer Epidemiol. Biomarkers Prev., 20, 2011, 8, 1665–1672.
27. Peleteiro, B., C. La Vecchia, N. Lunet. The Role of Helicobacter Pylori Infection in the Web of Gastric Cancer Causation. Eur. J. Cancer Prev., 21, 2012, 2, 118–125.
28. Qiao, L., Y. Feng. Genetic Variations of Prostate Stem Cell Antigen (PSCA) Contribute to the Risk of Gastric Cancer for Eastern Asians: a Meta-analysis Based on 16792 Individuals. Gene, 493, 2012, 1, 83–91.
29. Selgrad, M., J. Bornschein, T. Rokkas, et al. Clinical Aspects of Gastric Cancer and Helicobacter Pylori – Screening, Prevention, and Treatment. Helicobacter, 15, 2010, Suppl. 1, 40–45.
30. Shimoyama, T., M. Aoki, Y. Sasaki, et al. ABC Screening for Gastric Cancer Is Not Applicable in a Japanese Population with High Prevalence of Atrophic Gastritis. Gastric Cancer, 15, 2012, 3, 331–334.
31. Shin, W. G., H. U. Kim, H. J. Song, et al.; The Korean College of Helicobacter and Upper Gastrointestinal Research. Surveillance Strategy of Atrophic Gastritis and Intestinal Metaplasia in a Country with a High Prevalence of Gastric Cancer. Dig. Dis. Sci., 57, 2012, 3, 746–752.
32. Stamboliyska, M., I. Kotzev, P. Kolova. Successful Gastric Cancer Prevention.– Scr. Sci. Med. (Varna), 44, 2012, No 2, 89–91.
33. Suh, Y. S., H. J. Lee, E. J. Jung, et al. The Combined Expression of Metaplasia Biomarkers Predicts the Prognosis of Gastric Cancer. Ann. Surg. Oncol., 19, 2012, 4, 1240–1249.
34. Tian, M. M., Y. Sun, Z. W. Li, et al. Polymorphisms of ICAM-1 Are Associated with Gastric Cancer Risk and Prognosis. World J. Gastroenterol., 18, 2012, 4, 368–374.
35. Tramacere, I., C. Pelucchi, V. Bagnardi, et al. A Meta-analysis on Alcohol Drinking and Esophageal and Gastric Cardia Adenocarcinoma Risk. Ann. Oncol., 23, 2012, 2, 287–297.
36. Vannella, L., E. Lahner, B. Annibale. Risk for Gastric Neoplasias in Patients with Chronic Atrophic Gastritis: a Critical Reappraisal. World J. Gastroenterol., 18, 2012, 12, 1279–1285.
37. Xiao, Z. Y., Y. Ru, J. T. Sun, et al. Expression of CDX2 and Villin in Gastric Cardiac Intestinal Metaplasia and the Relation with Gastric Cardiac Carcinogenesis. Asian Pac. J. Cancer Prev., 13, 2012, 1, 247–250.
38. Yang, W. G., C. B. Chen, Z. X. Wang, et al. A Case-control Study on the Relationship between Salt Intake and Salty Taste and Risk of Gastric Cancer. World J. Gastroenterol., 17, 2011, 15, 2049–2053.
39. Zhou, H. J., S. C. Li, N. Naidoo, et al. Empirical Evidence of the Continuing Improvement in Cost Efficiency of an Endoscopic Surveillance Programme for Gastric Cancer in Singapore from 2004 to 2010. BMC Health Serv. Res., 13, 2013, 139. doi: 10.1186/1472–6963–13–139.
40. Zullo, A., C. Hassan, A. Romiti, et al. Follow-up of Intestinal Metaplasia in the Stomach: When, How and Why. World J. Gastrointestin. Oncol., 4, 2012, 3, 30–36.

Адрес за кореспонденция:

Д-Р МИГЛЕНА СТАМБОЛИЙСКА

Клиника по гастроентерология
УМБАЛ Св. Марина, Варна
Ул. Хр. Смирненски 1, Варна 9010
E-mail: m.stamboliyska@abv.bg

Address for Correspondence:

MIGLENA STAMBOLIYSKA, MD

Clinic of Gastroenterology
St. Marina University Hospital of Varna
1 Hristo Smirnenski Street, 9010 Varna
E-mail: m.stamboliyska@abv.bg

Increase of anaerobic threshold of women on a three-month specialized training and dietary program

Angelova P[1]., N. Boyadjiev[1], J. Grudeva-Popova[2]
[1] *Department of Physiology – Medical University, Plovdiv*
[2] *Department of Clinical Oncology – Medical University, Plovdiv*

Повишаване на анаеробния праг при жени, подложени на тримесечна специализирана тренировъчна и диетична програма

Пенка Ангелова.[1], Николай Бояджиев[1], Жанет Грудева – Попова[2]
[1] *Катедра по Физиология, Медицински Университет Пловдив;*
[2] *Катедра по Клинична онкология, Медицински Университет Пловдив*

РЕЗЮМЕ

ВЪВЕДЕНИЕ

Хората, подлежащи на програми за оптимизиране на телесната маса непрекъснато се увеличават. Ефективните методи за редуциране на телесна маса, лечение на затлъстяване, захарен диабет тип 2, метаболитен синдром и др. са диетичен режим и оптимално физическо натоварване. ЦЕЛ НА ПРОУЧВАНЕТО: Настоящото проучване имаше за цел да изследва промяната на анаеробния праг след прилагане на тримесечна специализирана тренировъчна и диетична програма.

МАТЕРИАЛ И МЕТОДИ

Група от 15 здрави жени на възраст 31.36±5.95 г. и с BMI 22.53±3.94 доброволно бяха подложени на тримесечна програма със специфичен двигателен и диетичен режим с цел подобряване на физическата работоспособност и оптимизира-

ABSTRACT

INTRODUCTION

The number of people subject to regimens for optimizing body mass constantly increases. The effective methods for body weight reduction, treatment of obesity, diabetes mellitus type 2, metabolic syndrome etc. are proper diet and optimal physical activity. AIM; The study was aimed at investigating the change in the range of the anaerobic threshold following a three-month specialized training and dietary program.

MATERIAL AND METHODS

A group of 15 healthy woman volunteers aged 31±5.95 with BMI 22.53±3.94 kg/m^2 underwent a three-month program of specific motor and dietary regimen aimed at improving physical capacity and optimizing body mass. Training sessions with intensive exercise (aerobics) were carried out trice-weekly. The partcipants were on a four meal food

не на телесната маса. Двигателната активност включваше трикратно седмично интензивно физическо натоварване (тренировки аеробика), а хранителният прием бе четирикратен и ограничен до 2500 kcal/24 h. В началото и в края на програмата беше определен анаеробния праг (АП) на участничките.

РЕЗУЛТАТИ

Преди началото на експерименталния период натоварването, при което участничките достигаха АП беше 95.45±3.66 W, а след края на третия месец бе сигнификантно по-високо – 133.64±7.42 W, P<0.001. Намаля изгарянето на въглехидрати при АП (от 82.19±15.36 до 52.64±16.96 kcal/h, P<0.05) за сметка на енергийна доставка от мазнини (от 242.55±21.92 до 354.45±10.84 kcal/h, P<0.001).

ЗАКЛЮЧЕНИЕ

Проведената, достъпна, тримесечна тренировъчна и диетична програма повиши АП на участничките. Метаболизмът се измести в посока преимуществена доставка на енергия от окислението на масти, в условие на аеробно натоварване.

Ключови думи: Диетичен режим, Двигателен режим, Анаеробен праг, Редукция на телесна маса

regimen providing up to 2500 kcal/24 h. The range of anaerobic threshold (AT) was determined at the beginning and at the end of the program.

RESULTS

Before the beginning of the progrm the stage of loading in the AT range was 95±3.94 W. After the end of third month it increased significantly to 133.64±7.42 W, P<0.001. Carbohydrate burning level in the AT range decreased (from 82.19±15.36 to 52.64±16.96 kcal/h, P<0.05) at the expense of the fat energy supply (from 242.55±21.92 to 354.45±10.84 kcal/h, P<0.001).

CONCLUSION

The tree-month accessible training and dietary program increased the range of AT. The metabolism shifted to predominant supply of energy at the expense of fat oxidation under the conditions of aerobic loading.

Key words: dietary regimen, training program, anaerobic threshold, body mass reduction

INTRODUCTION

The number of people subject to regimens for optimizing body mass increases constantly. Corpulence, obesity, metabolic syndrome and related deseases including cancer are important issues for conemporary medicine. The main ethiological factors for overweight are inproper diet and reduced physical activity[5, 7]. Effective treatment for these conditions include hypocaloric diet and optimal physical activity[1, 9]. Aerobic training programs have proven their efficacy both with young people (improvement of working capacity) and with adults[2, 6, 12].

Working muscles need energy during physical activity, whose supply depends on the individual capabilities of the cardiovascular system, respiratory system, blood etc. When the loading intensity is increased above AT the energy can not be produced by aerobic reactions[11, 13]. In loadings above AT energy supply is predominantly anaerobic, blood lactat increases and a state of fatigue is guickly reached. The range of AT is an effective assessment criterion of physical fitness both of helthy people and of patiants with cardiovascular deseases[13].

AIM

The study was aimed at investigating the change of the anaerobic threshold following a

three-minth specialized training and dietary program.

MATERIAL AND METHODS

A group of 15 healthy woman volunteers aged 31±5.95 with BMI 22.53±3.94 kg/m^2 underwent a three-month program of specific motor and dietary regimen aimed at improving physical capacity and optimizing body mass. The investigation included helthy women with clear medical history, and normal leves of blood fasting glucose, cholesterol, tryglyceride and HDL-cholesterol. The participants passed initial physical eaxmination. The volunteers with abnormal physical or blood tests were excluded. Before the beginning of the program detailed information was provided and the women signed an information consent form.

The anaerobic threshold (AT) of the paeticipants was determined at the beginning and at the end of the program.

Training program

Training sessions in Tae Bo (a type of intensive aerobics with martal art components) were carrid out thrice-weekly with a duration of 45-70 min according to the increasing physical potential of the participants. Choreography cosisted of series of punches and kicks, and aerobic steps set to rhythmic music. The basic set at the start of the sessions was made more and more complicated by adding more complex coordination movements, and increasing the tempo, and duration of the music. Due to the high intensity of performed combinations, in aerobics a mix type of energy supply is predominant including both aerobic and anaerobic pathways for the production of ATP in muscles[11].

Dietary program

The participants were on a four meal food regimen providing up to 2500 kcal/24 h, distributed in the following way: 1st breakfast – 20 % energy intake; 2nd breakfast – 10% ei.; lunch – 45% ei.; dinner – 25% ei. The last meal of the day was at 18:30 h. Intake of salt, refined sugar, and cholesterol was reduced, and intake of fats was un to 25-30%, as instructions for avoidance of saturated fatty acids were followed. For controling the food intake the women filled in dietary protocols and handed them in at the end of each week. Given the inreased energy expenditure and the desire for enhancement of muscle strenght and endurance, a controlled protein intake was introduced which was provided by protein blocks and reduced to 1.5 g/kg/24 h. All participants took L-carnitine (L-carnitine tartrate) and Lipozan (Neuber, Austria) in doses of 3x500 mg for both preparations.

Anaerobic threshold

AT was evaluated twice using spiroergometry tests of the SHILLER AT104 SpiroErgo system (Switzerland). The functional test began with symchronization of measurement – without loadind and with normal breathing for about 40 s, followed by a period of warming up for 1-3 minutes, and effective loading with a step-by-step increase of 30 W every two minutes. The recovery period proceded with 10% of peak loading for a minimum of five minutes. Spiroergometry tests were carried out without a training session or heavy physical loading during the precedind day.

Results were presented as X±SD. A two-way ANOVA t-test (STSTISTICA v. 6.0, StatSoft, U.S.A.) was performed to determine the authentity of variance between the value of the indices which were measured twice. A variance at $P<0.05$ was considered as significant.

RESULTS AND DISCUSSION

Before the beginning of the program the loading under which the AT was achieved was 95±3.94 W. After the end of third month it increased significantly to 133.64±7.42 W ($P<0.001$). The initial hearth rate at the AT level was 128±3.33 b p m and the final – 147.00±4.37 b p m ($P<0.05$). Oxygen consumption at AT (VO_2AT) before the start of the investigation was 1.09±0.06 l/min.

VO_2AT at the final tests increased significantly - 1.40±0.06 l/min (P<0.001) (Table 1).

Table 1. The loading (W), hearth rate (b p m) and oxygen consumption (l/mim) at the AT before and after the programe.

	The loading (W) at AT	Hearth rate (b p m) at AT	Oxygen consumption (l/min) at AT
Before	95.45±3.66	128±3.33	1.09±0.06
After	133.64±7.42	147.00±4.37	1.40±0.06
P	P<0.001	P<0.001	P<0.001

Initial levels of fat oxidation of the AT was 242.55±2.92 kcal/h and at the end increased to 354.45±10.84 kcal/h, P<0.001. Energy supply by carbohydrate at AT prior to the programe was 82.19±15.36 kcal/h and decreased significantly to 52.64±16.96 (P<0.05) after the third month (Figure 1).

A high ventilation (VE) / carbon dioxyde production (VCO_2) ratio (VE/VCO_{2slope}) is considered an unfavorable prognostic marker for patiants with cardiovascular deseases[8]. VE/VCO_{2slope} is determined for evaluation of the effect of training programs applyed for threatment of metabolic deseases[10]. The computed VE/VCO_{2slope} of the participants decreased significantly from 26.63±2.37 to 24.8±2.36 (P<0.05).

The increased AT indicate that in the third month a kind of adaptation occurs and under the conditions of aerobic loading metabolism shifts to predominant energy supply at the expense of fat oxidation in mitochondria. These changes provide a delay of the onset of fatigue and improve the working capacity.

CONCLUSION

The tree-month accessible training and dietary program increased the range of AT.

ACKNOWLEGMENTS

We thank Valentin Vasilev M.D. for helping with the forming of this manuscript.

Фигура 1. *представя стойностите на изгарянето на мазнини и въглехидрати (kcal/h) при АТ преди и след програмата.*

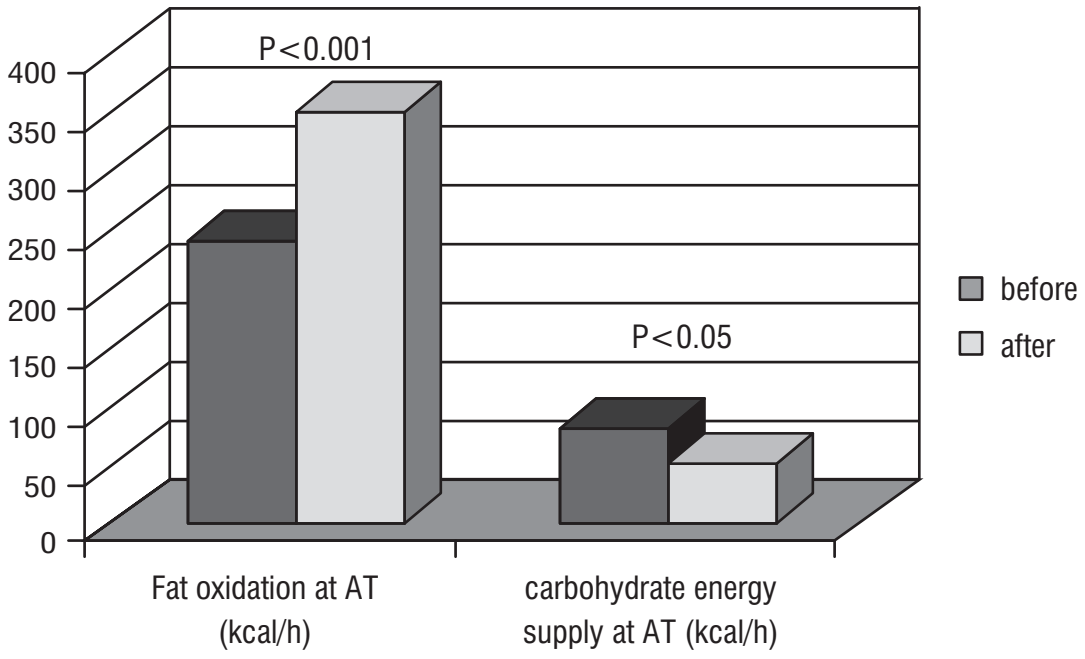


Figure 1. *The levels of fat oxidation (kcal/h) and energy supply by carbohydrate (kcal/h) before and after the programe*

REFERENCES

1. Aizawa K., J. Shoemaker, J. Overend et al. Metabolic syndrome, endothelial function and lifestyle modification. Diabetes and Vascular Disease research, 6, 2009, 3, 181-189.
2. DiPietro L., D. James, C. W. Yeckel et al. Exersice and improved insulin sensitivity in older woman: evidence of the endurind benefits of higher intensity training. Journal of Applied Physiology, 100, 2006, 142-149.
3. Knuttgen, H. Oxygen debt, lactate, pyruvate, and excess lactate after muscular work. Journal of Applied Physiology, 17, 1962, 639-644
4. Loat, C.E.R. and E. C. Rhodes. Relationship between the lactate and ventilatory thresholds during prolonged exercise. Sports Medicine, 15, 1993, 104-115.
5. Lutsey P., L. Steffen and J. Stevens. Dietary Intake and the Development of the Metabolic Syndrome The Atherosclerosis Risk in Cimmunities Study. Circulation, 117, 2008, 754-761.
6. Martins R., M. Verissimo, M. Coelho e Silva et al. Effects of aerobic and strength-based training on metabolic health indicators in older adults. Lipids in Health and Disease, 9, 2010, 76.
7. Owen N., G. Healy, C. Matthews et al. Too Much Sitting: The Population-Health Science of Sedentary Behavior. Exerce and Sport Science Reviews, 28, 2010, 3, 105-113.
8. Ross A., J. Myers, Syed S. A. et al. Peak VO2 and VE/VCO2 slope in patients with heart failure: a prognostic comparison. American Heart Jouenal, 147, 2003, 2, 354-360.
9. van den Brandt P. The impact of a Mediterranean diet and healthy lifestyle on premature mortality in men and women. The American Journal of Clinical Nutrition, 94, 2011, 913-920.
10. Vigorito C., F. Giallauria, S. Palomba et al. Beneficial effects of a three-month structured exercise training program on cardiopulmonary functional capacity in young woman with polycystic ovary syndrome. The Journal of Clinical Endocrinology & Metabolism, 92, 2007, 4, 1379 – 1384.
11. Бояджиев, Н. Енергийно осигуряване на физическата работа на организмово ниво. В: Мускулна работа и адаптация на организма към физическо натоварване. Аквафикс, Пловдив, 2012, 85 – 89.
12. Иванова, А. Състояние и динамика морфофункционалните показатели. В: Ефект от заниманията с аеробика върху някои морфофункционални и психофизически характеристики на 21-25-годишни студентки, София, 2011, 88-127.
13. Стефанов, Л. Определяне на анаеробен праг по V-наклон метода и чрез измерване на вентилацията при максимален велгоергометричен тест. Спорт & наука, 2004, 5, 56 – 63.

Адрес за кореспонденция:

ПЕНКА АНГЕЛОВА

Катедра по физиология
МУ Пловдив
Бул. Васил Априлов 15-А
Пловдив 4002
Tel.: +359 32 602 318
e-mail: angelovapepa@abv.bg

Address for Correspondence:

PENKA ANGELOVA

Department of Physiology
Medical University – Plovdiv
15A Vassil Aprilov blv.,
4002 Plovdiv, Bulgaria
Tel.: +359 32 602 318
e-mail: angelovapepa@abv.bg

Palmar dermatoglyphic patterns in the thenar and the hypothenar areas in schizophrenic patients and control subjects

Ferihan Ahmed-Popova[1], Stefan Sivkov[1], Pavel Nonchev[2], Valentin Akabaliev[2]
[1] *Department of Anatomy, Histology and Embryology, Medical University – Plovdiv*
[2]Department of Psychiatry and Medical Psychology, Medical University – Plovdiv

Длани дерматоглифични изображения в областта на тенара и хипотенара при шизофренно болни пациенти и контролни лица

Ферихан Ахмед-Попова[1], Стефан Сивков[1], Павел Нончев[2], Валентин Акабалиев[2]
[1] *Катедра по анатомия, хистология и ембриология, МУ – Пловдив*
[2] *Катедра по психиатрия и медицинска психология, МУ – Пловдив*

РЕЗЮМЕ

Цел

Целта на проучването е да установи честотата на истински длани дерматоглифични изображения в областта на тенара (Th) и хипотенара (Hy) при шизофренно болни в сравнение с контролни лица.

Материал и методи

В проучването са включени 68 хоспитализирани шизофренно болни (38 мъже, 30 жени) на средна възраст 32.01±9.69 г. и контролна група от 68 клинично здрави психично индивида (36 мъже и 32 жени) на средна възраст 39.12± 9.88 г. Отпечатъците са снемани по типографския метод и изследвани с помощта на леко увеличение (6D). Дланните папиларни изображения са изследва-

ABSTRACT

Aim

The aim of this study was to determine the incidence of palmar dermatoglyphic patterns in the thenar (Th) and hypothenar (Hy) areas in schizophrenic patients and control subjects.

Material and methods

The study included 68 schizophrenia patients (38 men, 30 women) aged 32.01±9.69 years and a normal comparison group of 68 mentally healthy subjects (36 men and 32 women) agd 39.12 ± 9.88 years. Rolled palmprints have been obtained using an ink method and nave been read with light (6D) magnification. Palmar dermatoglyphic patterns were examined in the hypothenar (Hy) area and in the thenar area and first interdigital space (Th/I).

ни в областта на хипотенара (Hy) и тенара заедно с I интердигитално поле (Th/I).

Резултати

Получените резултати показват повишена честота на истински длани изображения в Hy и намалена честота в Th/I при шизофренно болните мъже. При жените най-чести от истинските изображения в областта на хипотенара са радиалните примки (L^r), като на лявата ръка е налице по-изразено повишение спрямо контролната група. Шизофренно болните жени показват намалена честота на изображенията в областта на тенара. Флуктуиращата асиметрия е по-изразена за Hy изображения при мъжете и за Th/I изображения при жените.

Изводи

Получените резултати очертават само тенденция в различията в дланните дерматоглифи, като не достигат статистическа значимост. Данните насочват вниманието към възможните причини за установените различия и свързаните с тях полови особености в развитието на шизофренията.

Ключови думи: *дерматоглифика, шизофрения, тенар, хипотенар, длани дерматоглифични изображения.*

Results

The results showed an increased incidence of true palm patterns in the Hy area and reduced incidence in the Th/I in schizophrenic males. The most common of the palm patterns in females were the radial loops (Lr) in the hypothenar area and the differences from the control group were greater for the left hand. Schizophrenic females showed lower incidence of true patterns in the thenar area. Fluctuating asymmetry was higher for Hy patterns in males and for Th/I patterns in females.

Conclusions

A tendency rather than statistically significant difference in the palmar dermatoglyphic patterns is observed between schizophrenia patients and control subjects. The results point to possible causes of the observed heterogeneity and the gender related characteristics in the development of schizophrenia.

Keywords: *dermatoglyphics, schizophrenia, thenar, hypothenar, palmar dermatoglyphic patterns.*

INTRODUCTION

Dermatoglyphics is that part of science which studies the structure of the skin patterns on the fingers, palms and soles in order to determine the characteristics of an individual. Purkinje (1823) was the first who tried to systematize the fingerprint images (1), but practical classification, that is still valid offers F. Galton in 1891 (2).

Dermatoglyphic features are valuable signs not only for their use in the identification of the individuals due to their ontogenetic stability, but also because of the specificity of certain dermatoglyphic abnormalities in some diseases. The development of genetic research helps to establish the relationship of certain dermatoglyphic traits with a number of chromosomal aberrations such as Langdon Down syndrome, the Klinefelter syndrome, Turner syndrome, trisomy 17 and 18 (3). There is evidence for abnormalities in the finger patterns in sickle-cell disease, psoriasis, epilepsy, cancer, congenital heart disease, lupus erythematodes, mental disorders (4).

The importance of dermatoglyphics as biological markers of abnormal neurodevelopment in schizophrenia is associated with the common ectodermal origin of the brain and dermal patterns and the strictly defined periods of embryonic formation of papillary ridges that defines them as potential chronomarkers in determining the time of exposure

to prenatal insults. This applies primarily to the degree of fluctuating asymmetry, which is a random deviation from symmetry typical for the individuals, and is a sign of ontogenetic stability in different organisms, including humans (5, 6). The high degree of fluctuating asymmetry is considered a sign of impaired neurodevelopment occurring during the formation of papillary ridges, which is during the III-V months of embryogenesis. The main differentiation of the papillary ridges ends at the end of the IV month of prenatal development, but the ridges do not rise above the skin surface before the 18th week of gestation. The ridge patterns appear first on the pads of the fingers, and later on the palms and then on the soles (7). The critical period in differentiation is the III month, which is before the appearance of fingers on the limb germ. Harmful agents of different origin may interfere during the formation of the ridges and disrupt their normal development. It is obvious that deviations from the normal configuration of the papillary ridges can only be a result of genetic or exogenous factors acting during the period of embryogenesis.

The data with the greatest diagnostic value on palmar dermatoglyphics in schizophrenia, though limited in practice, is the low a-b ridge count, followed by differences in the atd angle and palm creases in schizophrenic patients compared with healthy controls (8, 9, 10, 11). This is most likely due to the long period of prenatal morphogenesis of the first interdigital space defining the a-b ridge count as one of the most sensitive traits to environmental influences (12).

The true palm patterns in the areas of the thenar (Th) and hypothenar (Hy) are among the least studied dermatoglyphic configurations. Jhingan and Munjal compared 50 males with catatonic schizophrenia and 50 healthy individuals of the same gender in quantitative and qualitative dermatoglyphic characteristics. Regarding the palm prints the authors observed a greater proportion of papillary patterns in the hypothenar area in the schizophrenic patients compared with the control subjects, though the differences did not reach statistical significance. The frequency of the images in the thenar and the first inter-digital space (Th/I) was lower in the patients than in the controls (13).

In a comparative dermatoglyphic study of 106 males and 205 females with schizophrenia and a control group of 200 males and 200 females Gyenis et al. established significant differences in the incidence of true palm patterns in the hypothenar area in schizophrenic females compared with healthy individuals of the same gender (14). The authors observed a reduction in the incidence of the palm patterns in the area of the thenar in the patients, and the differences were significant for the right hand in males and the left hand in females. Recent studies confirm the presence of gender differences in the palm patterns. Özyurt et al. imply a greater susceptibility of males to disruptions in normal brain development in schizophrenia, which is consistent with other dermatoglyphic studies (15, 16, 17).

The aim of this study was to determine the incidence of true palmar dermatoglyphic patterns in the areas of thenar (Th) and hypothenar (Hy) in schizophrenic patients and control subjects.

MATERIAL AND METHODS

Subjects

The study included 68 schizophrenia patients (38 men, 30 women) aged 32.01±9.69 years, consecutively admitted to the Clinic of Psychiatry in Plovdiv and the District Psychiatry Dispensary in Plovdiv. All patients satisfied DSM-IV criteria for a diagnosis of schizophrenia on the basis of case records review, a semi-structured interview based on a checklist of items from DSM-IV (18) (performed by one of the study psychiatrists, V.A.) and information obtained from relatives to enhance the valid-

ity of the diagnosis. According to the type of the disease patients were distributed as follows: paranoid type – 56, disorganized type – 1, catatonic type – 2, simple type – 3, undifferentiated type – 6.

Potential subjects were excluded if they had a history of drug or alcohol abuse, an identifiable neurological disorder (seizure disorder, head injury, multiple sclerosis etc.), any signs of mental retardation or a somatic disorder with neurological components, diagnosis of "schizophrenic spectrum disorders" – shizophreniform and schizoaffective disorder, shizotypal, schizoid and paranoid personality disorder. Potential patients were excluded if there were evidences of pathological conditions known to be associated with variation of dermatoglyphic characters, e.g., psoriasis, congenital abnormalities like polydactylia and spina bifida, congenital heart disorders, diabetes mellitus, certain diseases with abnormal caryotype, etc.

The normal comparison group comprised 68 mentally healthy subjects (36 men and 32 women) aged 39.12 ± 9.88 years. Normality was defined as the absence of a major axis I or axis II disorder according to DSM-IV. Normal controls satisfied exclusion criteria similar to those applied to patients. In addition, to separate the control from the schizophrenic group better, potential controls were excluded if they had a first-degree relative with a history of a psychotic disorder, major affective disorder or suicide.

All patients and control subjects were of Bulgarian origin in order to avoid the potential confounding effects of racial and ethnic variation in the expression of MPAs; individuals were excluded if their parental or grandparental ethnic group was other than Bulgarian.

The study was approved by the local Ethics Committee at the St George University Hospital. All subjects gave written informed consent to participate.

Assessment of dermatoglyphic patterns

A set of dermatoglyphic configurations with low racial instability and high diagnostic value was examined (19). Rolled palmprints were obtained using an ink method and were read with light (6D) magnification. Fingerprinting was carried out in a passive manner, using a rotary cone sample divider method. For a greater reliability the scoring of the palmprints was done separately by two persons according to the rules in Memorandum on dermatoglyphic nomenclature (20).

Palmar dermatoglyphic patterns were examined in the hypothenar (Hy) area and the thenar area and I interdigital space (Th/I). The hypothenar patterns were analyzed in accordance with the methods given by Cummins, Midlo (21) as arches – ulnar (Au), radial (Ar) and carpal (Ac); T-shaped patterns – ulnar (Tu), radial (Tr) and carpal (Tc); loops- ulnar (Lu), radial (Lr) and carpal (Lc); whorls (W) and spiral (Ws) patterns.

The patterns in the thenar and the first interdigital space (ID) were analyzed together. In order to signify them we used symbols similar to those of the hypothenar patterns. Traces of patterns were denoted by V, and the lack of patterns, i.e. the presence of an open arch towards the first finger was denoted by the symbol O. The double patterns were marked with an oblique line (/) between them, with the thenar pattern in the first place.

The degree of fluctuating asymmetry was used as a criterion for the body's ability to neutralize harmful insults during the prenatal period (22, 23). Fluctuating asymmetry was defined as the percentage of mismatch in the pattern of homologous structures, because of the assessment of quality features in the investigated areas of the palms.

Statistical analysis

The data were analyzed with SPSS 8.0. (Statistical Package for the Social Sciences 8.0), using

descriptive statistics, nonparametric analysis: c^2- test, Fisher's Exact Test, parametric analysis: Student's t -test (two-tailed).

The level of statistical significance was set at $P < 0.05$.

RESULTS

The incidence of dermatoglyphic patterns in the Hy and Th/I areas in schizophrenia patients and control subjects is shown in Table 1. Because of the known gender differences in the palmar dermatoglyphic patterns, the comparisons between schizophrenics and controls were carried out separately for each gender.

The ulnar arches (Au) occurred at highest incidence in the Hy area of both hands, but the values were lower than in the control group. Schizophrenic males showed higher incidence of true patterns compared with the control male group and the differences were more significant between the left hands. Patients showed a statistically significant increase only in the frequency of radial loops (Lr), the differences were more pronounced between the right hands (21.1% vs. 8.8% for the right hand and 28.9% vs. 17.6% for the left hand) ($P < 0.05$).

The differences in females showed only a tendency rather than significance. Among the different patterns in the Hy area the ulnar arches (Au) showed the greatest incidence in both hands, but the values were slightly elevated compared with the control group. The true patterns were more common in the left hand in schizophrenic patients, but the differences did not reach statistical significance. The most frequent true patterns were the radial loops (Lr), and significant difference compared to the control group was found for the left hand.

The gender comparison showed higher incidence of Au and Lr in the females ($P > 0.05$). The gender differences in schizophrenic pa-

Table 1.
Incidence of patterns in Hy and Th/I areas in schizophrenic patients and control subjects

	Males				Females			
	Schizophrenia (n=38)		Controls (n=36)		Schizophrenia (n=30)		Controls (n=32)	
Area	N	%	N	%	N	%	N	%
Right hand								
Hypothenar								
A	27	71.1	26	76.5	21	70.0	21	65.6
L	10	26.3	7	20.6	7	23.3	9	28.1
W	1	2.6	1	2.9	2	6.7	2	6.3
Thenar/I								
O	34	89.5	27	81.8	22	91.7	30	93.8
V	3	7.9	2	6.1	1	4.2	2	6.3
L	1	2.6	4	12.1	1	4.2	–	–
W	–	–	–	–			–	–
Left hand								
Hypothenar								
A	24	63.2	26	76.5	18	60.0	20	62.5
L	12	31.6	8	23.5	11	36.7	9	28.1
W	2	5.3	–	–	1	3.3	3	9.4
Thenar/I								
O	28	73.7	26	78.8	25	83.3	29	93.5
V	4	10.5	2	6.1	1	3.3	2	6.5
L	6	15.8	4	12.1	4	13.3	–	–
W	–	–	1	3.0	–	–	–	–

tients were less pronounced than in the control group due to the significantly increased incidence of Lr in men, and because of the modified frequency ratio of Au between sexes in schizophrenic patients.

The Th/I area was scanty in true patterns. Most often patterns vestiges (V) were present. Among the real patterns, the carpal loops (Lc) were the patterns that predominate, more common on the left hand. Despite these similarities, there was no unification in the characteristics of males and females. Schizophrenia males showed significantly lower incidence of true patterns compared with the control group for the right hand, while the left hand differences were not statistically significant. Bilateral differences in schizophrenic patients were more pronounced than in the control group.

Schizophrenic females showed very low incidence of patterns in this area. Differences in the control group were larger on the left hand because of the relatively higher rate of real patterns. Among the real images, only the Lc patterns were found, which, though in low frequency, were present in both hands as opposed to the controls. Traces of patterns were found in very low frequency in both hands.

Fluctuating asymmetry in the patterns in the Hy and Th/I palm areas was determined by the degree of matching patterns in homologous structures (Table 2).

The data showed gender-related differences in the coincidence of the palm patterns. In schizophrenic males there was a higher level of discordance in the Hy area compared with the controls ($P<0.05$), while schizophrenic females showed a higher level of discordance of the patterns in the Th/I compared with the control group, though the differences did not reach statistical significance ($P>0.05$).

DISCUSSION

The results show an increased incidence of true palm patterns in the Hy area and reduced frequency in the Th/I in schizophrenic males. Fluctuating asymmetry is higher for the Hy patterns in men and for the Th/I patterns in women. Although differences do not reach statistical significance, they point to possible causes of the observed heterogeneity and the gender related characteristics in the development of schizophrenia.

More interesting is the consistently elevated incidence of hypothenar Lr pattern in patients with schizophrenia. Although not widely used, it can enhance the strength of dermatoglyphic assessment of schizophrenics, if applied in constellation with other markers. The overall dermatoglyphic assessment of the respondents could be interpreted as an expression of caryotype abnormalities, similar to the chromosomal aberrations that are accompanied by certain dermatoglyphic changes. Studies on the caryotype of schizophrenic patients, however, show very low incidence of abnormalities (<1%), making the relationship between the dermatoglyphic changes and possible unrecognized chromosomal defects not probable (24, 25).

On the other hand dermatoglyphic differences between the schizophrenic patients and the healthy population could be due to changes in the relative frequency of normal genes that control the formation of papillary patterns. Such a change in gene frequency seems

Table 2. Comparison of matching patterns in the Hy and Th/I areas in schizophrenia patients and healthy controls, distributed by gender

	Males						Females					
	Schizophrenia (n=38)		Controls (n=36)		Statistical significance		Schizophrenia (n=30)		Controls (n=32)		Statistical significance	
Area	Mean	SD	Mean	SD	t	p	Mean	SD	Mean	SD	t	p
Hy	0.47	0.51	0.71	0.46	2.034	0.046	0.70	0.47	0.75	0.44	0.435	0.665
Th/I	0.84	0.37	0.79	0.42	0026	0.980	0.83	0.38	0.94	0.25	1.239	0.221

logical from the standpoint of the genetic theories of schizophrenia. However, the data on increased fluctuating asymmetry in the examined dermatoglyphic parameters match the etiologic theories associated with schizophrenia in the field of genetics and prenatal exposure to harmful neurodevelopmental processes. Adams and Niswander (26) suggested that polygenetic systems act as a buffer in the development of resistance to adverse environmental influences. Substitution of the genes in one of these systems can reduce the stability of the individual and thus may increase the fluctuating asymmetry and the likelihood of developmental abnormalities. This fact affects the inheritance of abnormalities in presence of family history, while single cases of deviations in normal development have different etiologies associated with the impact of exogenous agents operating during fetal development (26).

Our data determine the need for additional studies on dermatoglyphic traits in schizophrenic patients with the application of specific methodology, clearly identifiable criteria and the inclusion of a significantly higher number of respondents. The inclusion of dermatoglyphics as biological markers of abnormal neurodevelopment in the constellation of certain epidemiological, genetic, clinical and instrumental research would broaden the concepts of the etiology, pathogenesis and diagnosis of schizophrenia.

REFERENCES

1. Achs R, Harper R. Dermatoglyphics. Am J Obst Gynec 1968; 101 (7): 1006–18.
2. Galton F. Fingerprints. London: Macmillan, 1892, reprinted, New York, 1965.
3. Preus M, Fraser FC. Dermatoglyphics and syndromes. Amer J Dis Child 1972; 124.
4. Cannon M, Byrne M, Cotter D, Sham P, Larkin C, O'Callaghan E. Further evidence for anomalies in the hand-print of patients with schizophrenia: A study of secondary creases. Schizophr Res 1994; 13 (2): 179–84.
5. Markow T, Gottesman I. Fluctuating dermatoglyphic asymmetry in psychotic twins. Psychiatry Res 1989; 29: 37–43.
6. Markow T, Wandler K. Fluctuating dermatoglyphic asymmetry and the genetics of liability to schizophrenia. Psychiatry Res 1986; 19: 323–8.
7. Penrose LS, Ohara PT. The Development of the Epidermal Ridges. Journal of Medical Genetics 1973; 10, 201.
8. Sengupta S, Das Bhuyan S. Palmar dermatoglyphics in schizophrenia. Indian J. Psychiat. 1995; 37(2): 86–90.
9. Fearon P, Lane A, Airie M, Scannell J, McGowan A, Byrne M, Cannon M, Cotter D, Murphy P, Cassidy B, Waddington J, Larkin C, O`Callaghan E. Is reduced dermatoglyphic a-b ridge count a reliable marker of developmental impairment in schizophrenia? Schizophrenia Research 2001; 50: 151–157.
10. Davis JO, Bracha HS. Prenatal growth markers in schizophrenia: a monozygotic co-twin control study. Am. J. Psychiatry 1996; 153: 1166–1172.
11. Bramon E, Walshe M, McDonald C, Martín B, Toulopoulou T, Wickham H, van Os J, Fearon P, Sham PC, Fañanás L, Murray RM. Dermatoglyphics and Schizophrenia: A meta-analysis and investigation of the impact of obstetric complications upon a–b ridge count. Schizophrenia Research 2005; 75: 399– 404.
12. Fatjó-Vilas M, Gourion D, Campanera S, Mouaffak F, Levy-Rueff M, Navarro ME, Chayet M, Miret S, Krebs MO, Fañanás L. New evidences of gene and environment interactions affecting prenatal neurodevelopment in schizophrenia spectrum disorders: A family dermatoglyphic study. Schizophrenia Research 2008; 103:209–217.
13. Jhingan HP, Munjal GC. Dermatoglyphics in male catatonic schizophrenics. Indian J. Psychiat. 1990; 32(2): 188–192.
14. Gyenis G, Hidegh A, Pethö B. Dermatoglyphics in Hungarian schizophrenic patients. Trends in Dermatoglyphic Research, 1990; 1: 146–155.
15. Ozyurt B, Songur A, Sarsilmaz M, Akyol Ö, Namli M, Demirel R. Dermatoglyphics as markers of prenatal disturbances in schizophrenia: a case-control study. Turk J Med Sci 2010; 40 (6): 917–924.
16. Daly MP, Gooding DC, Jessen HM, Auger AP. Indicators of developmental deviance in individuals at risk for schizophrenia.Schizophr Res 2008; 101: 152–60.
17. Jelovac N, Milicić J, Milas M, Dodig G, Turek S, Ugrenović Z.Dermatoglyphic analysis in bipolar affective disorder and schizophrenia: "continuum of psychosis" hypothesis corroborated? Coll Antropol 1999; 23: 589–95.

18. American Psychiatric Association. Diagnostic and statistical manual of mental disorders, ed. 4, Washington, DC, APA, 1994.
19. Хить Г, Долинова Н. Расовая дифференциация человечества (Дерматоглифические данные). Москва: Наука, 1990.
20. Penrose L. Memorandum on dermatoglyphic nomenclature. Birth Defects: Original Article Series 1968; 4 (3): 1–12.
21. Cummins H, Midlo C. Fingerprints, palms and soles. New York: Dover Publications, 1961.
22. Mellor CS. Dermatoglyphic evidence of fluctuating asymmetry in schizophrenia. Br J Psychiatry 1992; 160: 467–72.
23. Weinsten D, Diforio D, Schiffman E, Bonsall R. Minor physical anomalies, dermatoglyphic asymmetries, and cortisol levels in adolescents with schizotypal personality disorder. Am J Psychiatry 1999; 156 (4): 617–23.
24. Money J, Hirsch SR. Chromosome anomalies, mental deficiency and schizophrenia. Arch Gen Psychiatry (Chicago) 1963; 8: 242–51.
25. Raphael T, Shaw MW. Chromosome srudies in schizophrenia. JAMA 1963; 183: 1022–8.
26. Adams MS, Niswander JD. Developmental “noise” and a congenital malformation. GenetRes 1967; 10: 313–317.

Адрес за кореспонденция:

Д-р Ферихан Ахмед-Попова

Катедра по анатомия,
хистология и ембриология
Медицински университет – Пловдив
бул. Васил Априлов 15А
гр. Пловдив, 4002
e-mail: ferylin@abv.bg
моб. тел.: 0898 581 071
сл. тел.: 032/ 602 230

Address for Correspondence:

F. Ahmed-Popova

Department of anatomy,
histology and embryology
Medical University Plovdiv
Vassil Aprilov str. 15-A
4002 Plovdiv
Bulgaria

Assessment of burnout syndrome among prison staff

Stanislava N. Harizanova[1], Nonka G. Mateva[2],
Tanya H. Turnovska[1], Valentin H. Akabaliev[3]
[1] Medical University-Plovdiv, Faculty of Public Health, Department of Hygiene and ecomedicine
[2] Medical University-Plovdiv, Faculty of Public Health, Department of Medical Informatics, Biostatistics and e-learning
[3] Medical University-Plovdiv, Faculty of Medicine, Department of Psychiatry and Medical Psychology

Оценка на бърнаут синдром сред служители в затвори

Станислава Н. Харизанова[1], Нонка Г. Матева[2],
Таня Х. Търновска[1], Валентин Х. Акабалиев[3]
[1] Медицински университет-Пловдив, Факултет по обществено здраве, Катедра по хигиена и екомедицина
[2] Медицински университет-Пловдив, Факултет по обществено здраве, Катедра по медицинска информатика, биостатистика и електронно обучение“
[3] Медицински университет-Пловдив, Медицински факултет, Катедра по психиатрия и медицинска психология

РЕЗЮМЕ

Работата в затвора като надзирател е една от най-стресиращите, предизвикателни и трудни професии.

ЦЕЛ

Целта на това проучване е да се оцени нивото на бърнаут синдром сред служители в затвори.

МАТЕРИАЛ И МЕТОДИ

Първичната информация бе събрана с помощта на въпросник, попълнен анонимно и доброволно. Анкетираните са 201 полицейски служители, работещи в два затвора в България. Единственият критерий в подбора на извадката е

ABSTRACT

Working in a prison as a guard is one of the most stressful, challenging and demanding occupations.

AIM

The aim of this study is to assess the level of burnout syndrome among prison staff.

MATERIALS AND METHODS

Primary information was collected using a questionnaire completed anonymously and on a voluntary basis. The respondents are 201 police officers working in two prisons in Bulgaria. The only qualification in the sample selection was that the employee has direct contact with inmates. Two major

работникът да има пряк контакт с лишените от свобода. Две основни конструкции – демографски променливи и оценка на бърнаут по метода на Бойко – бяха включени в използвания въпросник.

РЕЗУЛТАТИ

Бърнаут синдром е намерен при 73.13% (n = 147) от извадката. Съобщават се високи стойности и за трите фази на бърнаут (фаза на напрежение – 36.32%, фаза на резистенция – 66.67%, фаза на изтощение – 34.33%). Т-тест анализа показва, че служителите офицери съобщават по-високи нива на напрежение (t=1.56, p=0.03) и емоционално изтощение (t=1.23, p=0.04), отколкото инспекторите. Надзирателите с 3 до 5 години работа в затвора имат по-високи нива на напрежение в сравнение с новопостъпилите служители (p=0.03).

ЗАКЛЮЧЕНИЕ

В България до момента бърнаут синдром сред полицаи, работещи в затвори не е проучван. Открихме високи нива на бърнаут и неговите три фази сред служителите. От социално-демографски характеристики, само работно място и трудовият стаж в затвора са сигнификантно свързани с бърнаут. Резултатите потвърждават необходимостта от проучване на ефективни стратегии за намаляване и предотвратяване на бърнаут.

Ключови думи: бърнаут синдром, полицейски служители, затвор

constructs – demographic variables and burnout assessment using Boiko's method – were included in a used questionnaire.

RESULTS

Burnout syndrome is found in 73.13% (n=147) of the sample. It is reported high values for all three phases of burnout (strain phase – 36.32%, resistance phase – 66.67%, exhaustion phase – 34.33%). A t-test analysis showed that the officer staff generally report higher levels of strain (t=1.56, p=0.03) and emotional exhaustion (t=1.23, p=0.04) than do inspector staff. The guards with 3 to 5 years of work at prison have higher levels of strain than the new employees (p=0.03).

CONCLUSION

In Bulgaria at present burnout among police officers working in prisons has not been studied. We have found high levels of burnout and its three phases among correctional officers. Among socio-demographic characteristics, only job position and number of years worked at the prison are significantly associated with burnout. The results confirm the need to explore the effective burnout strategies for reduction and prevent it.

Key words: burnout syndrome, police officers, prison

INTRODUCTION

Burnout syndrome, which results from chronic occupational stress, is in fact a modern pathology to which the work force is exposed [1]. Freudenberger [6] who is considered to be the pioneer on this subject, described "Staff Burnout" as syndrome of exhaustion, disillusionment and withdrawal in voluntary health workers. Burnout is persistent, negative, work-related state of mind in "normal" individuals. There is no generally accepted definition of burnout. The syndrome is widely present in today's work force. It was first and foremost visible in the human services. Because burnout appears to be specific to the work domain, the phenomenon might be found in different types of occupations. Burnout is being studied among physicians [12, 14], teachers [4], and police officers [1, 7]. There has been little research on correctional staff burnout [8]. In Bulgaria, at present burnout among police officers working in prisons has not been studied.

The **AIM** of this paper is to assess the level of burnout syndrome among correctional officers.

MATERIALS AND METHODS

The all available staff at prisons in the Regional Prison of Pazardzhik and the Regional Prison of Sliven was surveyed. The prison in Pazardzhik for men inmates encompasses the building of the prison itself and two open type correctional communities. In Bulgaria there is only one prison for women and one correctional facility for minor girls, both located in Sliven. The primary information was collected among 201 people (100 were employees of the Regional Prison of Pazardzhik and 101 – of the Regional Prison of Sliven). Six socio-demographic characteristics were selected – gender, age, marital status, education, job position, tenure. The used instrument for measure of burnout is Boiko's method, adapted and validated in Bulgarian. V. Boiko [13] describes the dynamics of job burnout differentiating three stages each of which is manifested in the form of four symptoms (Fig.1).

The method contains 84 items. Each statement in the questionnaire in its positive or negative version is attributed a given number of points that form the total score for each symptoms. Once the total score for each symptom has been calculated, the score by stages needs to be calculated. Special attention is paid to symptoms with scores in excess of 20 points as they are the leading symptoms and the stage to which they belong is determined as dominating. The quantitative indicators provide understanding of the degree of formation of each stage, i.e. the level of completeness. The test allows identification of the leading symptoms of burnout (12 symptoms), the current phase of burnout (3 phases) and the presence of burnout syndrome. The clarity and homogeneity of interpretation of the scales is a significant advantage of Boiko's method. Thus the score obtained from this test can be easily compared to the results obtained using other psychological diagnostic techniques. All these benefits make it the appropriate tool for assessment of burnout in our study. The used questionnaires were accompanied by a letter in which the goal of the study was briefly introduced, and the confidentiality and anonymity of the answers were emphasized. Data was collected between June and December 2012. The only qualification in the sample selection was that the employee has direct contact with inmates.

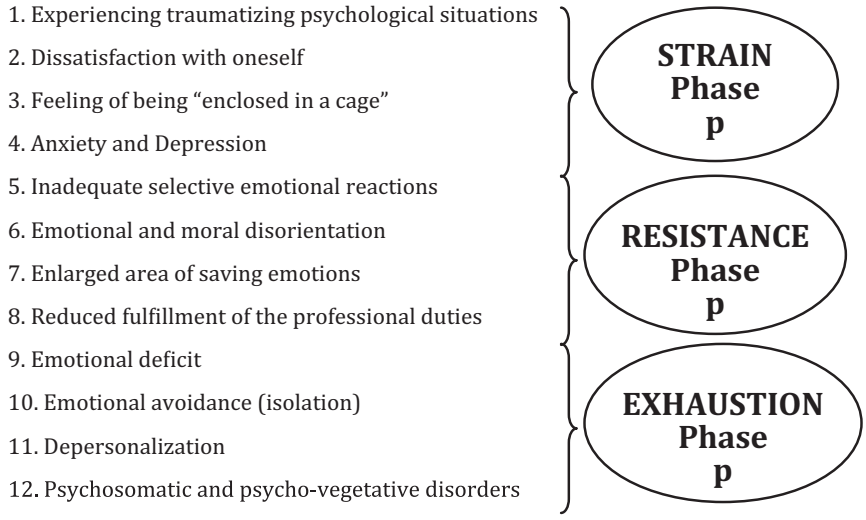


Figure 1
Symptoms and phases of burnout syndrome according to Boiko's method

STATISTICAL ANALYSES

The statistical program SPSS version 17.0 was used for the statistical analysis. A descriptive analysis (mean, standard error of means) was conducted on the sample, followed by a Student t-test and one-way ANOVA. Student's t-test and one-way ANOVA were performed to determine if any significant differences in the level of burnout and its three subscales exist between the prison staff according to their demographic characteristics. A p-value < 0.05 (two-tailed) was considered statistically significant.

RESULTS

Table 1 reports the socio-demographic characteristics of the survey respondents.

Table 1.
Socio-demographic characteristics of the respondents

Measure		Number	%	Mean ± SE
Gender				
	Female	87	43.28	
	Male	114	56.72	
Age				
Continuous years				41.32 ± 0.54
	Education			
	College	124	61.69	
	University	77	38.31	
Marital status				
	Married	146	72.64	
	Divorced	22	10.95	
	Widowed	6	2.99	
	Single	27	13.43	
Rank				
	Officer	141	70.15	
	Inspector	60	29.85	
Tenure				
Years employed				11.71 ± 0.50

The means and standard error of means for burnout scale and its three subscales are presented in Table 2.

Table 2.
Means and standard error of means for burnout and its subscales

Burnout and its phases	No of cases	No of items	Mean	SE
Strain	201	28	31.60	1.61
Resistance	201	28	44.51	1.33
Exhaustion	201	28	33.01	1.40
Burnout	201	84	109.12	3.90

Burnout syndrome is found in 73.13% (n=147) of the sample. It is reported high values for all three phases of burnout (strain phase – 36.32%, resistance phase – 66.67%, exhaustion phase – 34.33%). In Figure 2 we present the level of burnout and its components among correctional officers.

We used a Student t-test and one-way ANOVA to check the significance of the mean differences of burnout and its subscales between the employees according to their demographic characteristics (Table 3).

A t-test analysis showed that the officer staff generally report higher levels of strain and emotional exhaustion than do inspector staff. The guards with tenure 3 to 5 years worked at prison have higher levels of strain than the new employees.

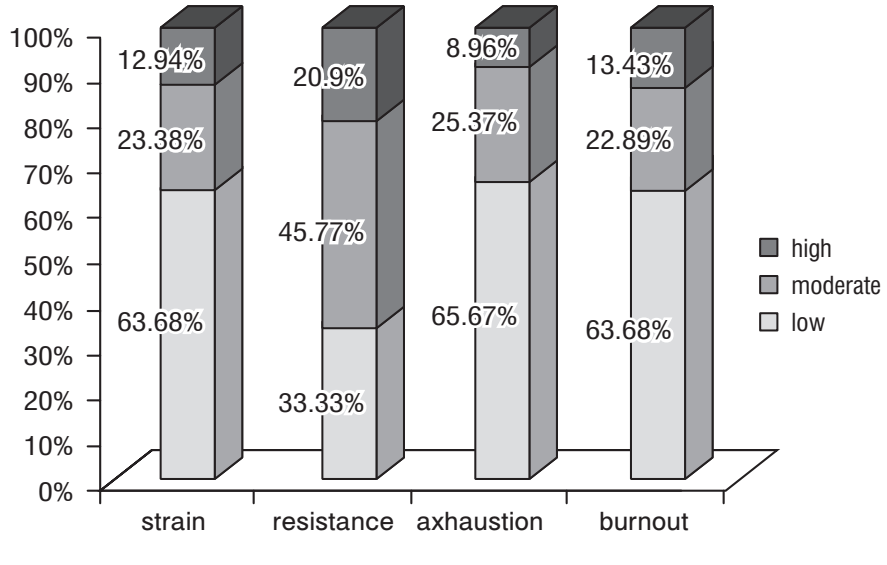


Figure 2.
Level of burnout and its phases among respondents

DISCUSSION

Burnout syndrome is a problem among correctional officers. Within correctional facilities (e.g. prisons, jails), it is estimated that 37% of correctional officers experience job stress and burnout [3]. This is higher than the estimated 19–30% in the general working population. Using Boiko's method we found that 73.13% of our participants reported experiencing some symptoms of job burnout during the course of their career. It is reported high values for all three phases of burnout in this study. The prison or jail organization,

Table 3.
Impact of demographic characteristics on three burnout dimensions

Burnout and it subscales Demographic characteristics	Strain Mean ± SE	Resistance Mean ± SE	Exhaustion Mean ± SE	Burnout Mean ± SE
Gender				
Male	31.75±2.21	42.76±1.83	32.03±1.87	106.54±5.34
Female	31.41±2.34	46.80±1.89	34.30±2.10	112.52±5.70
Age				
< 30	20.00±5.22	39.00±3.90	28.67±3.57	87.67±10.96
31 – 40	32.38±2.60	42.99±1.97	32.92±2.17	108.29±6.19
41 – 50	33.11±2.37	46.89±2.21	33.61±2.23	113.61±6.02
> 51	29.48±5.19	44.83±3.90	33.52±4.59	107.83±12.54
Educational level				
University	31.66±2.55	45.77±2.37	32.43±2.42	109.86±6.60
College	31.56±2.08	43.73±1.57	33.37±1.70	108.67±4.84
Marital status				
Married	31.84±1.89	44.60±1.58	33.07±1.68	109.51±4.62
Divorced	31.55±4.27	41.73±3.68	29.59±3.55	102.86±10.32
Widowed	28.83±8.72	44.00±5.43	31.67±3.54	104.50±16.27
Single	30.96±5.00	46.41±3.84	35.78±4.10	113.15±12.00
Rank				
Officer	**33.42±1.96***	44.36±1.55	**34.09±1.64***	111.87±4.66
Inspector	**25.64±3.11***	44.07±3.13	**27.30±2.81***	97.00±8.10
Years of service at the prison	**19.25±4.54***	36.25±4.07	29.39±3.59	84.88±11.09
< 1	28.38±5.23	43.50±5.22	36.38±3.52	108.25±12.54
1 – 3	**42.25±7.40***	49.50±6.15	36.19±7.14	127.94±18.93
3 – 5	32.12±1.80	44.96±1.46	32.71±1.60	109.78±4.36
> 5				

* p-value is < 0.05.

including understaffing, overtime, shift work, and supervisor demands, creates stress for many officers. Work-related sources of stress for officers include the threat of inmate violence, actual inmate violence, inmate demands and manipulation, and problem with coworkers. Without doubt, this chronic occupational stress can lead to burnout. Burnout is caused due to characteristics of the job and working environment. There is considerable evidence that work setting characteristics, particularly job position and tenure, influence levels of psychological burnout. We found that officer staff generally report higher levels of strain and emotional exhaustion than do inspector staff (supervisory officers). Correctional officers have the primary responsibility of maintaining safety and security within the walls of the institution by closely monitoring, supervising and managing the inmates [5]. Lack of participation in decision-making, low decision latitude, role ambiguity, and constant contact with inmates has significantly increased the level of burnout of our sample. Our results show that worker (inspector) in high decision latitude are less likely to be burn out. Therefore, the decision latitude can moderate the relationship between the stressor and burnout because high decision latitude in dangerous situations allows correctional officers to deal with those situations effectively with their own decision authority for that moment. The correctional officers are also exposed to authoritarian management style having poor personal relationship with supervisor. Lack of adequate resources, lack of autonomy in performing duties and lack of recognition for work accomplishment and excessive paper work are enough to make them emotionally exhausted [11].

People vary in the expectations they bring to their job. Whether the high expectations are considered to be idealistic or unrealistic, one hypothesis has been that they are a risk factor for burnout. High expectations lead people to work too hard and do too much, thus leading to exhaustion when the high effort does not yield the expected results. This hypothesis has received mixed empirical support [9]. As far as job tenure is concerned, our study shows that employees who stay longer in a job will have higher likelihood of suffering from job burnout. The one-way ANOVA indicates significantly different levels of strain between correctional officers with less than one year of work experience and correctional officers with more than three years of experience. A Tukey

post hoc procedure on the strain subscale shows than guards with three to five years of experience report significantly higher level than officers with less than one year of work. It may be that officers newly introduced into the correctional environment are overly optimistic regarding their ability to be of service to society and possibly helping a troubled population, but as they develop and mature as correctional officers, this enthusiasm wanes and is replaced by more realistic approach to the job [10]. Burnout is a psychological syndrome that may emerge when employees are exposed to a stressful working environment, with high job demands and low resources [2].

CONCLUSION

We have found high levels of burnout and its three stages among correctional officers – strain, resistance and exhaustion. Among sociodemographic characteristics, only job position and number of years worked at the prison are significantly associated with burnout. The results confirm the need to explore the effective burnout strategies for reduction and prevent it.

ACKNOWLEDGEMENTS

The current paper has been conducted with the financial support of the Plovdiv Medical University under research project НО-22/2012. The authors would like to thank the correctional officers that participated in this study and the administration of the prisons for their cooperation.

REFERENCES

1. Aranda, C.B., M.M., Pando, J.G.E., Salazar et al. Social Support, Burnout Syndrome and Occupational Exhaustion among Mexican Traffic Police Agents. Spanish J. Psychol., 12, 2009, 2, 585–592.
2. Bakker, A.B., E., Demerouti. The job demands-resources model: state of the art. J. Manag. Psychol., 22, 2007, 309–328.
3. Bourbonnais, R., R., Malenfant, M., Vezina et al. Les caracteristiques du travail et la sante des agents en service de detention. Revue Epidemiologique Sante Publique, 53, 2005, 127–142.
4. Brackett, M.A., R., Palomera, J., Mojsa-Kaja, et al. Emotion-regulation ability, burnout, and job satisfaction among British secondary-school teachers. Psychol. School, 47, 2010, 4, 406–417.
5. Finney C., E., Stergiopoulos, J., Hensel et al. Organizational stressors associated with job stress and burnout in correctional officers: a systematic review. BMC Public Health, 2013, 13:82.
6. Freudenberger H.J. Staff Burnout. J. Soc. Issues. 30, 1974, 159–165.
7. Ivie, D., B., Garland. Stress and burnout in policing: does military experience matter? PIJPSM, 34, 2011, 1, 49–66.
8. Neveu, J. Jailed resources: Conservation of resources theory as applied to burnout among prison guards. J. Org. Behav., 28, 2007, 21–42.
9. Maslach, C., W.B., Schaufeli, M.P., Leiter. Burnout. Annu. Rev. Psychol., 52, 2001, 397–422.
10. Morgan, R.D., R.A., van Haveren, C.A., Pearson. Correctional officer burnout: Further analysis. Criminal Justice and Behavior, 29, 2002, 2, 144–160.
11. Ranta R.S., A., Sud. Management of stress and burnout of police personnel. J. Indian Academy Appl. Psychol., 34, 2008, 1, 29–39.
12. Raycheva, R., R., Asenova, D., Kazakov et al. The vulnerability to bur out in health care personnel according to Stoyanov-Cloninger's model: evidence from a pilot study. Int. J. Pers. Cent. Medicine, 2, 2012, 3, 552–563.
13. Бойко В. Методика диагностики уровня эмоционального выгорания. Практическая психодиагностика: Методики тесты. Самара, 1999, 161–169.
14. Малыгин В.Л., А.С., Искандирова, Е.Е., Пахтусова et al. Социально-психологические факторы риска формирования эмоционального выгорания у врачей психиатров и наркологов. Медицинская психология в России: электрон. науч. журн., 4, 2011.

Адрес за кореспонденция:

Д-р ст. Харизанова, МУ-Пловдив,

ФОЗ, к-ра: „Хигиена и екомедицина",
e-mail: dr.harizanovi@abv.bg

Address for Correspondence:

Dr. St. Harizanova, MU-Plovdiv,

FPH, Department of Hygiene and ecomedicine,
e-mail: dr.harizanovi@abv.bg

Assistant pharmacists' role in health promotion: Bulgarian national survey

Angel M. Dzhambov[1], Donka D. Dimitrova[2]
[1]Faculty of Medicine, Medical University – Plovdiv, MMSc student
[2]Department of Health management, Health economics and Primary Care, Faculty of Public Health, Medical University – Plovdiv, Associate Professor

Ролята на помощник фармацевтите в здравната промоция: национално проучване в България

Ангел М. Джамбов[1], Донка Д. Димитрова[2]
[1] Медицински факултет, Медицински Университет – Пловдив, студент специалност Медицина
[2] Катедра Здравен мениджмънт, икономика на здравеопазването и обща медицина, Факултет по Обществено здраве, Медицински Университет – Пловдив, доцент

РЕЗЮМЕ

Целта на проучването е да изследва потребностите, нагласите, квалификацията и възможностите на помощник фармацевтите да участват в здравната промоция. Проведено е срезово анкетно проучване с оригинален инструментариум съдържащ 24 въпроса от затворен и отворен тип. Все повече нарастват потребностите на пациентите от съвети за здравословно хранене, контрол на теглото и ограничаване на вредните навици. Резултатите от проучването показват, че участниците са уверени в подготовката и способностите си да дават професионални съвети, като самооценката им за способността да извършват качествено тази дейност кореспондира с честотата на търсене на консултации. По-голямата част 80% (n = 178, p = 0.000) съобщават, че "често" извършват дейности извън нормативните ограничения. Основните ограничения за извършване на здравно-промоционна

ABSTRACT

The aim of this paper is to assess the necessities, attitude, current qualifications and the possibilities pharmacy assistants (known in Bulgaria as assistant pharmacists) to participate in the promotion of healthy lifestyle. A cross-sectional questionnaire survey was conducted using specially designed questionnaire comprising 24 close-ended and open-ended questions. Patients' need for guidance about healthy diet and weight loss and cessation of bad habits is prevalent. The participants are confident in their knowledge and ability to provide professional consultations and their perceived ability to give quality advices corresponds very well with the frequency they are expected to. 80% (n = 178, p = 0.000) "often" undertake tasks beyond the regulated by the law. The main barriers for health promotion are legal issues and a possible confrontation with a master-pharmacist. However, 94.5% (n = 208, p=0.000) of the participants

дейност са нормативни и свързани с възможно конфронтиране с магистър-фармацевтите. Все пак 94.5% (n = 208, p=0.000) от участниците изразяват желание да участват в програми за обучение по здравна промоция, въпреки че имат значителни опасения, свързани с отношението от страна на магистър-фармацевти и нерешени правни аспекти. За първи път у нас научният интерес се поставя върху проблемите в тази професионална група, а нейната решимост при отстояване на професионални интереси налага допълнително проучване.

Ключови думи: помощник фармацевти, промоция, ограничения, здравословен начин на живот

are willing to participate in postgraduate health promotion training. However, the major concerns arise from the attitude of master-pharmacists and still unresolved legal issues. This question is officially addressed in the scientific circles for the first time as a national problem of the bachelor pharmacists' guild and its determination to stand up for their interests should be explored.

Keywords: pharmacy assistants, promotion, barriers, healthy lifestyle

INTRODUCTION

According to the "International classification of health workers" based on the "International Standard Classification of Occupations (ISCO, 2008)", health associate professionals perform technical and practical tasks to support diagnosis and treatment of illness, disease, injuries and impairments, and to support implementation of health care, treatment and referral plans. Appropriate formal qualifications are often an essential requirement for entry to these occupations; in some cases relevant work experience and prolonged on-the-job training may substitute for the formal education. Pharmaceutical technicians and assistants, in particular, perform a variety of tasks associated with dispensing medicinal products under the guidance of a pharmacist or other health professional. They inventory, prepare and store medications and other pharmaceutical compounds and supplies, and may dispense medicines and drugs to clients and instruct on their use as prescribed by health professionals (5).

Large proportion of interactions in community pharmacies takes place with pharmacy counter assistants rather than the pharmacist (6). In many practice settings, pharmacy technicians have assumed greater responsibilities and are vital in pharmacy practice, freeing pharmacists to concentrate on clinical care concerns (15). Pharmacy assistants and technicians are critical to the pharmacy team, and it is imperative that they be appropriately trained to take on their roles and responsibilities. Numerous pharmacy organizations in the USA support the need for a national standard for pharmacy technician training, education, certification, and regulatory oversight in all practice settings (4). Providing a pharmacy technician with proper training and education is necessary for operating a successful pharmacy. In the USA, mandating a national standardized training programme is the source of debate (2).

In the recent years the interest towards a possible expansion of the role of pharmacy assistants is growing worldwide. Sheridan et al. (2011) found that pharmacy assistants in New Zealand tend to see themselves as the first point of contact for customers, and that they fulfilled an important healthcare role for the public (13). According to the study of Potter et al. (2013), the majority of British pharmacy technicians were in favour of continuing professional development (11). Cassano (2012) examined the parenteral nutrition training for pharmacy technicians (4). Wilson et al. (2007) assessed pharmacist and pharmacy technician

opinions on functions community pharmacy technicians should perform and found significant differences in reference to roles that focused on patient care and beyond technicians' traditional involvement in processing prescriptions, with technicians having a more expansive view of their roles than did pharmacist respondents (16).

The terms and duties of pharmacy assistants and technicians overlap in different countries. In most countries the title pharmacist is a protected one, with only those whose names appear on a register being allowed to use it. An assistant pharmacist would be a qualified and registered pharmacist lacking the range of experience of a more senior pharmacist. Bulgarian master-pharmacists are individuals graduated from a medical university. In Bulgaria pharmacy technicians are known in the society as assistant pharmacists but strictly speaking they are bachelor pharmacists. In this paper they are referred to as assistant pharmacists (APs) although for international auditory pharmacy assistant would be more appropriate term. After graduating from a medical college they are granted the title professional bachelor which is inferior to bachelor and master. The Bulgarian definition for APs coincides with the USA definition for pharmacy technician – "an individual working in a pharmacy [setting] who, under the supervision of a licensed pharmacist, assists in pharmacy activities that do not require the professional judgment of a pharmacist" (1). APs are the only guild without the right for Union. After they graduate from Medical College as professional bachelors, they are not allowed to continue their education at a university level, in contrast to USA, where in 2002 approximately 247 schools and training institutions in 42 states offered a range of credentials, including associate degrees, diplomas, and certificates, to pharmacy technicians. But even in those social setting most programs have been referred to as "training" rather than "education" of pharmacy technicians (14). In the USA there is a Pharmacy Technician Certification Board that certificates pharmacy technicians (10).

There is a prejudice among some master-pharmacists that the involvement of APs in health promotion might be dangerous for the patients' health. This attitude was observed in New Zealand where the lack of mandatory training and a clearly articulated role meant that in some cases pharmacy assistants might be seen as little more than general retail assistants – a view not in line with their actual roles and practices (13). Rough et al. (1996) described a new staffing model for decentralized pharmacists and support staff at a university hospital and concluded that the pharmacists were not confident in the assistants' ability to perform many of the drug distribution and record-keeping functions previously performed by pharmacists (12). In Ohio, on the other hand, most hospital pharmacists agreed that all technicians should receive standardized training and education, and more than a third believed that technicians should be certified and did not believe that increased use of technicians would eliminate present pharmacist positions (7). Even Ohio hospital pharmacy directors had positive attitudes about pharmacy technicians' certification (9). In the USA a majority of states have revised their pharmacy practice acts in areas related to technicians (14).

Not only in Bulgaria, but worldwide as well APs' and technicians' scope of practice has not been sufficiently examined (14).

Up to 2002 in the USA one of the activities that could not be performed by a pharmacy technician included patient counselling (14). Up until recently, according to the Bulgarian law for Drug products in the human medicine, APs did not have the right to council patients at all. With a change in the law from December 21 2012, APs can now perform all tasks of master-pharmacists except for selling prescription drugs and counselling patients about drug products. The latter clarification opens a possibility for APs to join master-pharmacists in the promotion of healthy lifestyle at pharmacy level

which is of current interest in public health (8). Years ago in the USA scientists have understood that proper preparation of pharmacy technicians to work with pharmacists is important in the promotion of public health (14).

The present study is a continuation of our efforts to study all aspects of pharmaceutical public health. The aim was to assess the necessities, attitude, current qualifications and the possibilities for Bulgarian APs to participate in the promotion of healthy lifestyle.

MATHERIALS AND METHOD

Study design

In the period of 23 May – 6 July 2013 a cross-sectional questionnaire survey was conducted amongst APs. A two stage random sampling method was used. To determine the sample size in the first stage of the study a pilot run results from 30 APs were used to determine the standard deviation (SD) and relative shares for the qualitative variable of greatest interest: willingness for postgraduate health promotion qualification. The determined number of participants calculating for 95% degree confidence and an error of 5% was 96. After adjusting for the expected non-response rate it was determined that 192 participants were to be recruited.

Ethics

The survey was voluntary and anonymous, socio-medical, non-interventional and self-report and therefore was not subjected to ethical evaluation by our University. It was carried out after obtaining participants' informed consent about the objectives and conditions of the study.

Methods of selection

Eighty three questionnaires were distributed and collected during the National Gathering for the fifth anniversary of the National Association of Bachelor Pharmacists (26 June 2013). Additional 160 questionnaires were distributed in four Bulgarian cities by student volunteers and 137 (85.6%) were returned completed. A totality of 220 APs completed and returned the questionnaires from both data collection procedures.

Tools

Specially designed questionnaire comprising 24 close-ended and open-ended questions, divided into four major panels: demographic, healthy lifestyle counselling and attitude and barriers for postgraduate qualification. The majority of the questions were identical to those previously distributed among master-pharmacists by the authors but some specific questions aiming to better understand the specific positions of APs in the pharmaceutical care were included as well.

Inclusion/exclusion criteria

Inclusion criteria: APs working for the last six months. Exclusion criteria: Decline to participate, incomplete completion of the questionnaire.

Statistical methods

Descriptive statistics, parametric and nonparametric analyses were performed. To check the normality of the distribution the Shapiro-Wilk tests were used. Pearson and Spearman's correlation analyses were used. When testing hypotheses for incidental (accidental) effect of a factor Fisher's exact χ^2 test and the criterion for significance level of $P < 0.05$ (two-tailed) were used. Graphical analysis was applied as well. Statistical data processing was performed using the software SPSS v.17 (SPSS Inc., 2008. SPSS for Windows (17.0.0), Chicago).

RESULTS

Of the 220 APs who participated in the survey none were excluded based on exclusion criteria and all of them were included in the statistical analysis.

Demographic and working characteristics of the participants

The mean age of the participants was 42.9 (± 11.1) years where the youngest was 25 years old and the oldest – 64 years. Only 2.7% (n = 6. p = 0.000) were over 60 years and the others were equally distributed (≈ 20%) in the ranges under 30, 31–40, 41–50 and 51–60 years. The majority of the participants were women (97.3%, n = 214, p = 0.000) with only 2.7% being men. As there is not an official register of APs, the sample cannot be compared with the characteristics of the studied population but it is believed to be fairly representative.

In reference to the working profile of the participants it was found that the mean years of service were 21.3 (± 11.4), that APs attended to an average of 89 (± 46) patients/day and worked 42.9 (± 11.1) hours a week. As expected, the majority (69.5%, n = 153, p= 0.000) of the APs worked 31–40 hours/week, 49.5% (n = 109, p = 0.000) had over 20 years of service and 48.6% (n = 107, p= 0.000) attended to 51–100 people/day.

Because the survey was national it included APs working in villages (8.6%, n = 19), small towns (22.7%, n = 50) and big cities (68.6%, n = 151) which was statistically significant (p = 0.000). The majority worked at pharmacies (88.6%, 195, p = 0.000) with only 7.3% and 4.1% working at a drugstore or elsewhere, respectively. No significant differences were found in reference to the satisfaction from the salary 55.5/44.5% (satisfied/unsatisfied).

Healthy lifestyle promotion

Because APs were not allowed to council patients up until recently, and they themselves do not yet realize that this is no longer a taboo, it would have been inappropriate to ask for their involvement in healthy lifestyle counselling, so they were asked how often during the last six months were they required by the patients to give advices about each of the following elements (table 1). This formulation of the question might be more adequate than the one previously used, because this way the whole panorama of the patients' needs can be looked at.

Like in the survey investigating masters-pharmacists, the following main elements of healthy lifestyle were defined: "Cessation of bad habits" (smoking, drinking, etc.), "Sport", "Healthy diet and optimal body weight", "Stress management", "Personal hygiene", "Ecotoxicology" (reducing the exposure to hazardous environmental pollutions), "Violence and accident reduction" and "Medical prophylaxis".

Table 1 demonstrates that the element most frequently asked about is "Diet and weight loss" (58.6%, n = 129, p = 0.000), followed by "Cessation of bad habits" (47.6%, n = 105, p = 0.000). However, "Sport" (≈ 30%, p = 0.000) and "Violence and accident reduction" (≈30–42%, p = 0.000) are "never" or "very rarely" asked about.

Next, APs' confidence in their ability to provide quality information and guidance about these elements of healthy lifestyle promotion was sought (Figure 1).

Table 1.
Healthy lifestyle about which the APs have been ask to provide consultation

Element	Percent of cases* (%)			
	Never	Very rarely	Sometimes	Often
Cessation of bad habits	5.8	6.1	15.5	**19.2**
Sport	**16.4**	**21.3**	14	2.7
Diet and weight loss	7.2	1.7	12.2	**23.5**
Stress management	17.6	7.2	7.5	16.1
Personal hygiene	11.6	18.7	12.2	9.5
Ecotoxicology	12.8	12.4	11.1	13.5
Violence and accident reduction	**22.5**	**19**	11.1	2
Medical prophylaxis	6	13.5	16.6	13.5

*The total number exceeds 100% because the participants have given multiple responses

The most indicated elements are "Diet and weight loss" and "Cessation of bad habits" – 59.1% (n = 130, p = 0.007) and 76.4 % (n = 168, p = 0.000) of the participants, respectively, responded affirmatively. Eighty nine percent consider healthy lifestyle promotion their professional duty.

When the healthy lifestyle elements which APs are expected to be qualified about and their subjectively perceived qualification were correlated, strong and moderate negative correlations were found between the perceived qualification and patients' inquiries for "Cessation of bad habits" (r_s = -0.270, p = 0.000), "Sport" (r_s = -0.289, p = 0.000), "Diet and weight loss" (r_s = -0.256, p = 0.000), "Stress management" (r_s = -0.448, p = 0.000), "Personal hygiene" (r_s = -0.386, p = 0.000), "Violence and accident reduction" (r_s = -0.216, p = 0.001) and "Medical prophylaxis" (r_s = -0.327, p = 0.000). Eighty five percent of the APs were willing to advice a person even without being asked to, and 89.1% (n = 196, p = 0.000) were willing to risk a possible confrontation or open conflict with a master-pharmacist by doing so. This suggests commitment to health promotion and desire to contribute to patients' health.

Attitude towards postgraduate qualification

After the need for inclusion of APs in health promotion and their perceived ability to adequately respond to these expectations (the negative correlations are due to the coding of the variables) were determined, the next objective was to investigate the attitude towards further training which is currently impossible for professional bachelors and is one of the rights that APs struggle for.

Approximately 80% (n = 178, p = 0.000) of the participants reported that they "often" undertake tasks beyond the regulated by the law – selling prescription drugs, interpreting recipes, etc. Almost all APs (98.6%, p =0.000) were convinced that if they had more rights they would contribute to the work team and the success of the pharmacy.

Only 6.8% (n = 15, p= 0.000) of the APs feel their potential to contribute to patients' positive health completely fulfilled. The remaining 93.2% consider it unfulfilled of partially fulfilled. Approximately half of the APs reported that they had been trained in health promotion but they were referring only to antismoking activities. It was unnecessary for us to seek for a predicting model in reference to the willingness for postgraduate qualification in health promo-

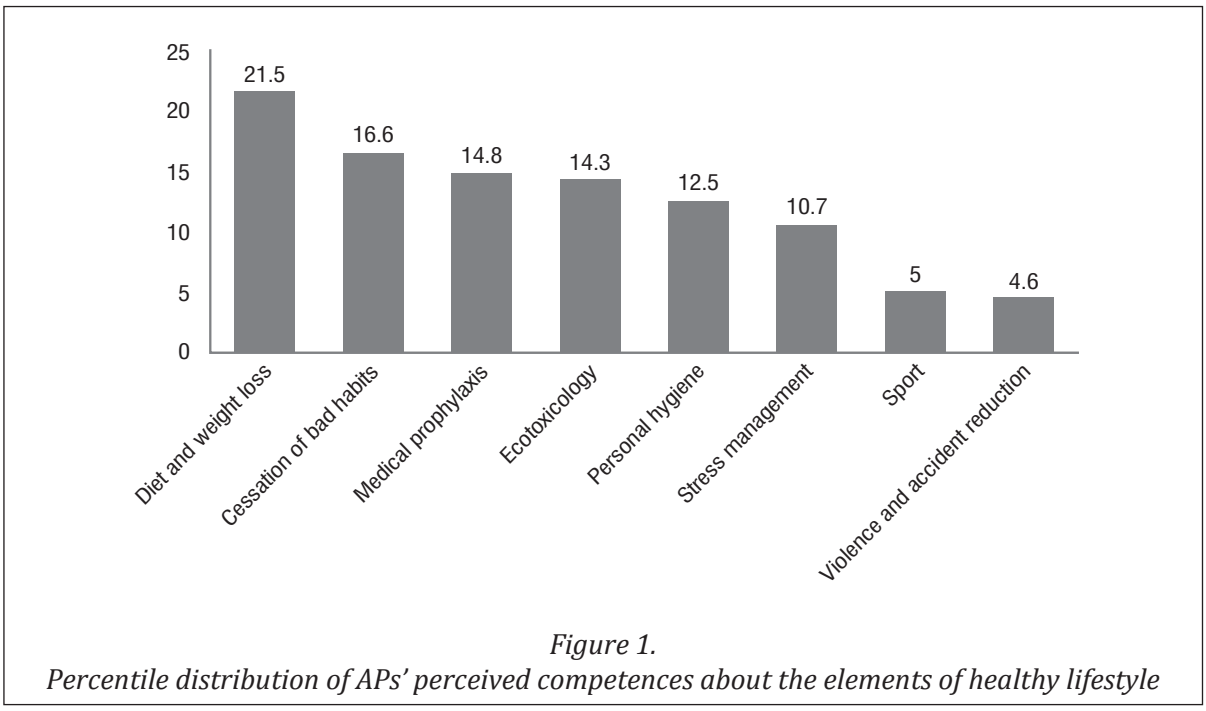


Figure 1.
Percentile distribution of APs' perceived competences about the elements of healthy lifestyle

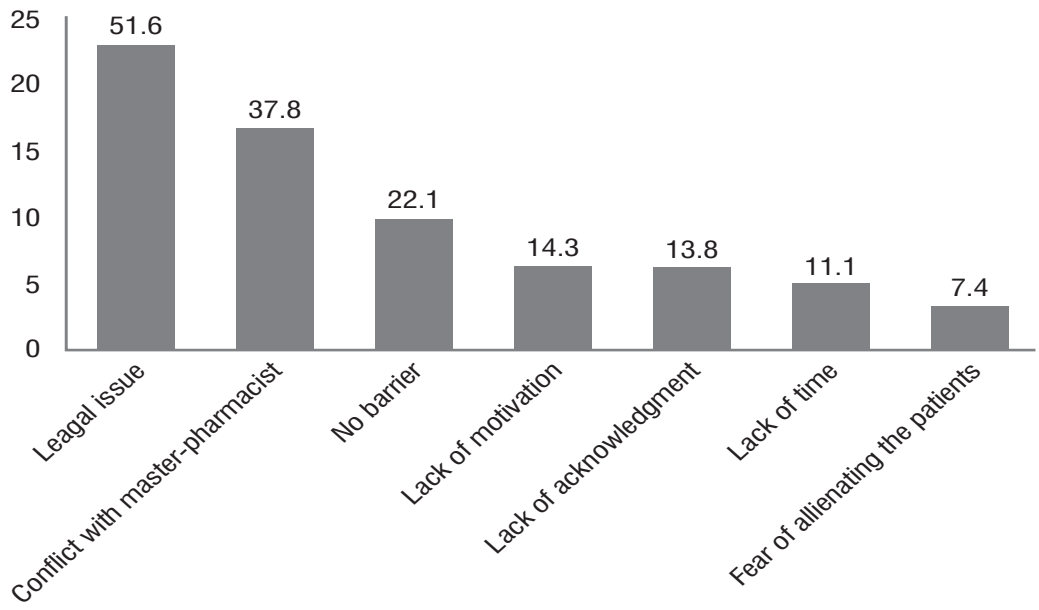


Figure 2.
Percentile distribution of the barriers for health promotion by APs
(The total number exceeds 100% because the participants have given multiple responses)

tion, as 94.5% (n = 208, p=0.000) of the participants answered positively. Approximately the same percent (93.6%, p = 0.000) find courses an acceptable form of training that would not rise professional conflict with the master-pharmacists. However, only 34.5% (n = 76, p = 0.00) want to improve their communicative skill. As for the motivation for further qualification, one half of the participants indicated financial interest, higher salary, etc. while for 43.2% (n = 95, p = 0.000) the main reason is to improve the quality of pharmaceutical care and 5.5% want to start their own practice.

Barriers

As the main argument of master-pharmacists for opposing the initiative of Bulgarian APs is that by counselling patients APs might endanger their health and well-being, the opinion of the APs was sought. Almost all of them (98.6%, p = 0.000) disagree with this prejudice especially in reference to healthy lifestyle counselling. The same percent (95.9%, p = 0.000) responded negatively to the second major concern – that APs might eliminate present pharmacists' positions and undermine their contributions to the pharmacy. Figure 2 displays the distribution of the reported barriers for health promotion. As expected, "Legal issues" and "Conflict with master-pharmacist" are significantly more frequently indicated (p = 0.000) than any other barrier.

DISCUSSION

The results showed that the patients' need for guidance about healthy diet and weight loss and cessation of bad habits is prevalent. APs are generally confident in their knowledge and ability to provide professional consultations about these healthy lifestyle elements of greatest interest among the general population. The correlation analysis convincingly showed that despite the lack of specialized training, APs' perceived ability to give quality advices corresponds very well with the frequency they are expected to. The majority of APs reported high frequency of undertaking tasks which could be considered illegal and about which, paradoxically, the master-pharmacists reproached them

officially, but not in everyday practice. This is very common practice in villages where there are not any master-pharmacists. The main barriers for health promotion are legal issues and a possible confrontation with a master-pharmacist. In fact, the latter is the reason for the reluctance of many APs to even participate in the survey. However, the main outcome of the survey is that almost all of the participants are willing to participate in postgraduate health promotion training and believe that by doing so they will contribute not only to their own personal improvement and financial benefit but to the success of the pharmacy and the well-being of patients as well.

The present study is following a global trend in pharmaceutical education and combines it with the concept for pharmaceutical public health. It is a first time survey on the topic in Bulgaria and is original in its approach towards the subject proposing a new niche for APs. The cross-sectional design is the only one capable of determine prevalence and having in mind the descriptive nature of the paper, it is justified. The results could be considered truly representative of the studied population at a national level. However, a possible limitation is the reporting bias that might have arisen from the distribution of the questionnaires during the celebration of the fifth anniversary of the National Association of Bachelor Pharmacists whose aim is to extend their legal rights.

The self-awareness of Bulgarian APs about the key role that they play at the pharmacy and about the greater responsibilities that they have assumed, freeing pharmacists to concentrate on clinical care, confirmed the findings of foreign authors (13,15). Nevertheless, APs are sometimes considered a "second hand" healthcare professionals and are operating in fear of being reproached by a master-pharmacists. This supports the finding of Rough et al. (1996) that the master-pharmacists were not yet confident in the assistants' competencies (12). Bulgarian APs, in contrast to those studied by Braund et al. (2012), are exceedingly interested in further training, and even more so than British technicians who were in favour of continuing their professional development (11). They support a more expanded patient care role for themselves like the technicians in Florida (16). APs also believe that the expansion of the their role in oral health promotion would be of value to patients (6).

This expresses the aims that the National Association of Bachelor Pharmacists has set before its members – to enrich their professional knowledge and to deserve a respected place in the society. It is hope of the authors that this paper will set a scientific grounding for future debates with the Government and the Pharmaceutical Union in order to expand the legal rights of APs. We are aware that the lack of the extensive knowledge that master-pharmacists have does not permit APs to be granted the same rights. However, as healthy lifestyle promotion is a non-specific practise, we believe that the workforce of APs could contribute to the welfare of the society if proper training is available. It is a challenge for the faculties of Public Health in the country to implement the training of APs. Some progress is currently evident.

CONCLUSIONS

Bulgarian APs are willing to continue their training in health promotion. However, the major concerns arise from the attitude of master-pharmacists and still unresolved legal issues. This question is officially addressed in the scientific circles for the first time as a national problem of the bachelor pharmacists' guild and its determination to stand up for the interests of APs should not be underestimated.

REFERENCES

1. 1995 candidate handbook—national pharmacy technician certification examination. Washington, DC: Pharmacy Technician Certification Board; 1995:15.
2. Alkhateeb, F.M, Shields KM, Broedel-Zaugg K, et al. Credentialing of pharmacy technicians in the USA. In.t J. Pharm. Pract., 19, 2011, 4, 219–27.

3. Braund, R., Chesney, K.M., Keast. E.P., et al. Are all pharmacy staff interested in potential future roles? Int. J. Pharm. Pract., 20, 2012, 6, 417–21.
4. Cassano, A.T. Parenteral nutrition training for the pharmacy team: focus on pharmacy technicians. J. Parenter. Enteral. Nutr., 36, 2012, 2 (Suppl), 48S-50S.
5. Classification of health workforce statistics, World Health Organization, Geneva. Archived by WebCite® at: http://www.webcitation.org/6I4foyNgb. Assessed: June 06 2013.
6. Gill, P. Summary of: Pharmacy counter assistants and oral health promotion: an exploratory study. Br. Dent. J. 211, 2011, 9, 426–427.
7. Govern, V..L, Birdwell, S.W., Sherrin, T.P. Attitudes of Ohio hospital pharmacists toward pharmacy technicians. Am. J. Hosp. Pharm., 48, 1991, 6, 1228–33.
8. Laliberté, M.C., Perreault, S., Damestoy, N., et al. Ideal and actual involvement of community pharmacists in health promotion and prevention: a cross-sectional study in Quebec, Canada. BMC Public Health, 12, 2012, 192.
9. Mott, D.A., Vanderpool, W.H., Smeenk, D.A. Attitudes of Ohio hospital pharmacy directors toward national voluntary pharmacy technician certification. Am. J. Health. Syst. Pharm., 55, 1998, 17, 1799–803.
10. Pharmacy Technician Certification Board (PTCB). Archived by WebCite® at: http://www.webcitation.org/6I4gvZCR6. Assessed June 18 2013.
11. Potter, H., Hassell, K., Noyce, P.R. Pharmacists' and pharmacy technicians' views on a process of revalidation of pharmacy professionals in Great Britain. Res. Social Adm. Pharm., 9, 2013, 2, 142–54.
12. Rough, S.S., Reid-Ganske, L.M., Thielke, T.S., et al. Work redesign and role restructuring in a pharmacy department with pharmacist assistants. Am. J. Health. Syst. Pharm., 53, 1996, 16, 1928–33.
13. Sheridan, J., Kelly, F., Basheer, M., et al. Can I help you? A qualitative study of pharmacist and pharmacy assistant views on the role of pharmacy assistants in New Zealand. Int. J. Pharm. Pract., 19, 2011, 4, 228–35.
14. White paper on pharmacy technicians 2002: Needed changes can no longer wait. Am. J. Health. Syst. Pharm., 60, 2003, 37–51.
15. Wick, J.Y. Using pharmacy technicians to enhance clinical and operational capabilities. Consult. Pharm., 23, 2008, 6, 447–58.
16. Wilson, D.L., Kimberlin, C.L., Brushwood, D.B., et al. Constructs underlying community pharmacy dispensing functions relative to Florida pharmacy technicians. J. Am. Pharm. Assoc., 47, 2007, 5, 588–98.

ACKNOWLEDGMENTS

The authors would like to acknowledge the assistance of Prof. Bachelor Liliana Pavlova (Secretary of the National Association of Bachelor Pharmacists) in collecting the primary data.

CONFLICT OF INTERESTS STATEMENT

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors. The authors do not participate in the educational process of assistant pharmacists, do not have any relations with National Association of Bachelor Pharmacists and do not receive any benefits from conducting this study. Our interest in the topic is strictly scientific.

Адрес за кореспонденция:

АНГЕЛ ДЖАМБОВ

Мецицински Факултет, МУ Пловдив
Студент по медицина
Васил Априлов 15-А
Пловдив 4002
e-mail: angelleloti@gmail.com
Тел: +359897950802

Address for Correspondence:

ANGEL DZHAMBOV.

Faculty of Medicine,
Medical University – Plovdiv,
MMSc student. 15-A Vasil Aprilov Blvd.,
4002 Plovdiv, Bulgaria,
e-mail: angelleloti@gmail.com Tel:
+359897950802

Резюмето на статията:
Болест на Wilson – диагностичен и терапевтичен подход,

Д. Ганчева, И. Коцев,

Bulgarian Medicine, 2013, Vol.3 (2):11–20

СЛЕДВА ДА СЕ ЧЕТЕ:

„Болестта на Wilson е необикновено генетично заболяване поради това, че може ефективно да бъде лекувано. Лечението е насочено към намаляване на токсичното отлагане на мед в тялото и постигане на негативен меден баланс. Терапията с хелатори и цинкови соли е опора на лечението до живот. Чернодробната транспантация осигурява корекция на подлежащия метаболитен дефект."

Грешката е допусната в ръкописа на авторите.

От редкационната колегия

The Bulgarian Medicine Journal, official edition of the Bulgarian Academy of Science and Arts, Science Division, Research Center for Medicine and Health Care is published in 4 issues per year. It accepts for publication reviews, original research articles, case reports, short communications, opinions on new medical books, letters to the editor and announcements for scientific events (congresses, symposia, etc) in all fields of fundamental and clinical medicine. The journal is published in English with exceptional reviews on significant topics in Bulgarian. The detailed abstracts and the titles of the articles, the names of the authors and institutions as well as the legends of the illustrations (figures and tables) are printed in Bulgarian and English. Bulgarian medicine is available online at the website of the Academy, publications section.

The manuscripts should be submitted in two printed copies, on standard A4 sheets (21/30 cm), double spaced, 60 characters per line, and 30 lines per standard page.

The size of each paper should not exceed 10 pages (up to 5 000 words) for original research articles, 12 pages for reviews (7 500 words), 3 pages for case reports, 2 pages for short communications, 4 pages for discussions or correspondence on scientific events on medical books or chronicles. The references or illustrations are included in this size (two 9x13 cm figures, photographs, tables or diagrams are considered as one standard page).

The abstracts are not included in the size of the paper and should be submitted on a separate page with 3 to 5 key words at the end of the abstract. They should reflect the most essential topics of the article, including the objectives and hypothesis of the research work, the procedures, the main findings and the principal conclusions. The abstracts should not exceed one standard typewritten page of 200 words.

Списание „Българска медицина", издание на Българската Академия на Науките и Изкуствата, Отделение за наука, Научен център по медицина и здравеопазване, излиза в четири книжки годишно. „Българска медицина" е достъпна онлайн на сайта на БАНИ, раздел издания.

В него се отпечатват оригинални научни статии, казуистични съобщения, обзори, рецензии и съобщения за проведени или предстоящи научни конгреси, симпозиуми и други материали в областа на клиничната и фундаменталната медицина. Списанието излиза на английски език с подробни резюмета на български и английски. Изключения се правят за обзорни статии по особено значими теми. Заглавията, авторските колективи, а също надписите и означенията на илюстрациите и в таблиците се отпечатват и на двата езика.

Материалите трябва да се предоставят в два еднакви екземпляра, напечатани на пишеща машина или на компютър, на хартия формат А4 (21 х 30 см), 60 знака на 30 реда при двоен интервал между редовете (стандартна машинописна страница). Освен това могат да бъдат изпратени като прикачени файлове по електронната поща на адресите, посочени по-долу.

Обемът на представените работи не трябва да превишава 10 стандартни страници за оригиналните статии (или 5000 думи според стандарта на англосаксонските издания) 12 страници (7 500 думи) за обзорните статии, 3–4 страници за казуистичните съобщения, 4 страници за информации относно научни прояви в България и в чужбина, както и за научни дискусии, 2 страници за рецензии на книги (монографии и учебници). В посочения обем се включват книгописът и всич-ки илюстрации и таблици. В същия не се включват резюметата на български и английски, чий-то обем трябва да бъде около 200 думи за всяко

The basic structure of the manuscripts should meet the following requirements:

TITLE PAGE

The title of the article, forename, middle initials (if any) and family name of each author; institutional affiliation; name of department(s) and institutions to which the work should be attributed, address and fax number of the corresponding author.

TEXT OF THE ARTICLE

Titles and subtitles should be standardized. The original research reports should have the following structure: introduction (states the aim, summarizer the rationale for the study), subjects and materials, methods (procedure and apparatus in sufficient detail, statistical methods), results, discussion, conclusions (should be linked with the aims of the study, but unqualified statements not completely supported by research data should be avoided). These requirements are not valid for the other types of manuscripts. Only officially recognized abbreviations should be used, all others should be explained in the text. Units should be used according to the International System of Units (S. I. units). Numbers to bibliographical references should be used according to their enumeration in the reference list.

Illustrations

Photographs should be presented both in the text body to indicate their location and in separate files as saved in jpeg, tif or bitmap formats.

The figures, diagrams, schemes, photos should be submitted in a separate file with: consecutive number (in Arabic figures); titles of the article and name of the first author. The explanatory text accompanying the figures should be presented along with the respective number of the figure in the main text body with space left for insertion of the figure.

(25–30 машинописни реда). Резюметата се представят на отделни страници.Те трябва да отразяват конкретно работнатахипотеза и целта на разработката, използваните методи, най-важните резултати и заключения. Ключовите думи (до 5), съобразени с „Medline“, трябва да се посочат в края на всяко резюме.

Структурата на статиите трябва да отговаря на следните изисквания:

ТИТУЛНА СТРАНИЦА

а) заглавие, имена на авторите (собствено име и фамилия), название на научната организация или лечебното заведение, в което те работят. При повече от едно за ведение имената на същите и на съответните автори се маркират с цифри или звездички;

б) същите данни на английски език се изписват под българския текст.

Забележка: при статии от чужди автори българският текст следва английския. Точният превод от английски на български се осигурява от редакцията. Това се отнася и за останалите текстове, включително резюметата на български.

Основен текст на статията. Заглавията и подзаглавията следва да бъдат уеднаквени и различими.

Оригиналните статии задължително трябва да имат следната структура: увод, материал и методи, собствени резултати, обсъждане, заключение или извод.

Методиките следва да бъдат подробно описани (включително видът и фирмата производител на използваните реактиви иапаратура). Същото се отнася и за статистическите методи.

Тези изисквания не важат за обзорите и другите видове публикации. В текста се допускат само официално приетите международни съкращения; при използване на други съкращения те трябва да бъдат изрично посочени в текста. За мерните единици е задължителна международната система SI. Цитатите вът-ре в текста е препоръчително да бъдат отбелязвани само с номерата им в книгописа.

References

The references should be presented on a separate page at the end of the manuscript. It is recommended that the number of references should not

Exceed 20 titles for the original articles and 40 titles for the reviews; 70 % of them should be published in the last 5 years. References should be listed in alphabetical order, English first, followed by the Bulgarian ones in the respective alphabetic order. The number of the reference should be followed by the family name of the first author and then his/her initials, names of the second and other authors should start with the initials followed by the family names. The full title of the cited article should be written, followed by the name of the journal where it has been published (or its generally accepted abbreviation), volume, year, issue, first and last page. Chapters of books should be cited in the same way, the full name off the chapter first, followed by"In:" full title of the book, editors, publisher, town, year, first and final page number of the cited chapter.

Examples:

Reference to a journal article:

1. McLachan, S. , M. F. Prumel, B. Rapoport. Cell Mediated or Humoral Immunity in Graves' Ophthalmopathy? J. Clin. Endocrinol. Metab., 78, 1994, 5, 1070–1074.

Reference to a book chapter:

2. Delange, F. Endemic Cretenism. In: The Thyroid (Eds. L. Braveman and R. Utiger). Lippincott Co, Philadelphia, 1991, 942–955.

Submission of manuscripts

The original and one copy of the complete manuscript are submitted together with a covering letter granting the consent of all authors for the publication of the article as well as a statement that it has not been published previously elsewhere and signed by the first author. The procedure should be complemented via electronic submission. Manuscripts of articles accepted

Илюстрации и таблици

Снимките – освен в Word, за да се знае местоположението им, следва да бъдат предоставени и като отделни файлове във формат jpg, tif или bitmap.

Илюстрациите към текста (фигури, графики, диаграми, схеми и др. черно-бели копия с необходимия добър контраст и качество) се представят на отделни листове (без обяснителен текст), в оригинал и две копия за всяка от тях. Текстът към фигурите със съответната им номерация (на български и на английски език) се отбелязва вътре в основното текстуално тяло на статията под съответния номер на мястото, където трябва да се разположи при предпечатната подготовка.Таблиците се представят с готово написани обяснителни текстове на български и на английски, които саразположени над тях; номерацията им е отделна (също с арабски цифри).

Използвана литература

Книгописът се представя на отделен лист. Броят на цитираните източници е препоръчително да не надхвърля 20 (за обзорите до 40), като 70 % от тях да бъдат от последните 5 години. Подреждането става по азбучен ред (първо на латиница, после на кирилица), като след поредния номер се отбелязва фамилното име на първия автор, след това инициалите му; всички останали автори се посочват с инициалите, последвани от фамилното име (в обратен ред) до третия автор, последвани от съкращшениетоет Al. Следва цялото заглавие на цитираната статия, след него названието на списанието (или общоприетото му съкращение), том, година, брой на книжката, началната и крайната страница. Глави (раздели) от книги се изписват по аналогичен начин, като след автора и заглавието на главата (раздела) се отбелязват пълното заглавие на книгата, имената на редакторите (в скоби), издателството, градът и годината на издаване, началната и крайната страница.

for publication will not be returned to the authors.

Peer-review process: following the international standards in the field, the Editorial board has adopted double-blind peer-review policy assigned to independent referees. The authors are encouraged to submit the names of three potential referees for editorial consideration

PUBLICATION ETHICS

Editors' obligations

The editor is responsible for deciding which of the articles submitted to the journal should be published.

The editor may be guided by the policies of the journal's editorial board and constrained by such legal requirements as shall then be in force regarding libel, copyright infringement and plagiarism. The editor may confer with other editors or reviewers in making this decision.

An editor at any time evaluate manuscripts for their intellectual content without regard to race, gender, sexual orientation, religious belief, ethnic origin, citizenship, or political philosophy of the authors.

The editor and any editorial staff must not disclose any information about a submitted manuscript to anyone other than the corresponding author, reviewers, potential reviewers, other editorial advisers, and the publisher, as appropriate.

Authors' obligations

The authors should ensure that they have written entirely original works, and if the authors have used the work and/or words of others that this has been appropriately cited or quoted.

An author should not in general publish manuscripts describing essentially the same research in more than one journal or primary publication. Submitting the same manuscript to more than one journal concurrently constitutes unethical publishing behaviour and is unacceptable.

ПРИМЕРИ:

Статия от списание:

1. McLachlan, S., M. F.Prumel, B. Rapoport. Cell Mediated or Humoral Immunity in Graves' Ophthalmopathy? J. Clin. Endocrinol. Metab., 78, 1994, 5, 1070–1074.

Глава (раздел) от книга:

2. Delange, F. Endemic Cretenism. In: The Thyroid (Eds. L. Braveman and R. Utiger). Lippincott Co, Philadelphia, 1991, 942–955.

Адрес за кореспонденция с авторите

Той се дава в края на всяка статия и съдържа всички необходими данни (вкл. електронна поща) на български език за един от авторите, който отговаря за кореспонденцията.

Всички ръкописи трябва да се изпращат с придружително писмо, подписани от авторите, с което потвърждават съгласието си за отпечатване в сп. „Българска медицина". В писмото трябва да бъде отбелязано, че материалът не е бил отпечатван в други научни списания у нас и в чужбина. Ръкописи не се връщат.

ПРОЦЕДУРА ПО РЕЦЕНЗИРАНЕ:

С оглед спазване на международните стандарти, редакционната колегия е приела процедура по 'двойно сляпа' рецензия от независимио референти. На авторите се предоставя възможноста да предложат на вниманието на редакционния екип три имена на специалисти в тяхната област като потенциални рецензенти.

ПУБЛИКАЦИОННА ЕТИКА

Задължения на редактора

Редакторът носи отговорноста за вземане на решението коя от изпратените статии да бъде публикувана.

При това редакторът се съобразява със законови ограничения, свързани с въздържане от дискредитиране, нарушаване на авторски права или плагиатство.

Редакторът оценява интелектуалната стойност на един труд без оглед на възраст,

Proper acknowledgment of the work of others must always be given. Authors should cite publications that have been influential in determining the nature of the reported work.

Authorship should be limited to those who have made a significant contribution to the conception, design, execution, or interpretation of the reported study. All those who have made significant contributions should be listed as co-authors. Where there are others who have participated in certain substantive aspects of the research project, they should be acknowledged or listed as contributors.

The corresponding author should ensure that all appropriate co-authors and no inappropriate co-authors are included on the paper, and that all co-authors have seen and approved the final version of the paper and have agreed to its submission for publication.

Obligations of the reviewers

Peer review assists the editor in making editorial decisions and through the editorial communications with the author may also assist the author in improving the paper.

Any manuscripts received for review must be treated as confidential documents. They must not be shown to or discussed with others except as authorized by the editor.

Reviews should be conducted objectively. Personal criticism of the author is inappropriate. Referees should express their views clearly with supporting arguments.

DISCLOSURE AND CONFLICTS OF INTEREST

Unpublished materials disclosed in a submitted manuscript must not be used in an editor‘s own research without the express written consent of the author.

All authors should disclose in their manuscript any financial or other substantive conflict of interest that might be construed to influence the results or interpretation of their manuscript. All sources of financial support for the project should be disclosed.

пол, расова принадлежност, сексуална ориентация, религиозни убеждения и пр. форми на дискриминация

Редакторът не разкрива информация по отношение на ръкописа на други лица освен резензентите, авторите за кореспонденция, издателя и другите членове на редакционната колегия.

Задължения на авторите

Авторите следва да осигурят оригинални произведения, в които не са използвани трудове или изрази на други автори без да бъдат цитирани.

По принцип авторите не следва да публикуват многократно материал, който повтаря по същество дадено изследване в други списания или първични публикации. Не се приема представянето на един и същи ръкопис в повече от едно списание едновременно.

Трудовете и приносът на другите автори, относими към предмета на ръкописа, трябва да бъдат отразени под формата на цитирания.

Всички лица, които да дали своя принос за концепцията, литературния анализ, дизайна, изпълнението или интерпретацията на данните, следва да бъдат посочени като съавтори.

Авторът за кореспонденция носи отговорност за това всички съавтори да бъдат запознати и да са изразили своето одобрение за съдържанието на предлагания за публикуване материал.

Задължения на рецензентите

Рецензентите подпомагат редкатора при вземане на решение. Посредством редакционната комуникация те могат да подпомогнат автора в повишаване а качеството на статията

Всички ръкописи, получени за рецензиране следва да се считат за поверителни материали и тяхното съдържание на следва да се разкрива пред никого, освен с разрешението на редактора.

Ethical regulations: reports with experiments on human subjects should specify whether the procedures were conducted in accordance with the ethical norms if the responsible committee on Human experimentation (local or regional) and/or with the Helsinki Declaration, as revised in 2000. Respective guidelines for animal experimentation should be considered.

PROCESSING CHARGES

Following acceptance for publication the authors are charged 5 euros per page for language editing and corrections.

ADDRESS FOR SENDING OF MANUSCRIPTS AND OTHER EDITORIAL CORRESPONDENCE

Prof. Dr Philip Kumanov
1431 Sofia, Zdrave str. 2, University Hospital for Endicrinology

AND THE NEXT ELECTRONIC ADDRESSES:

Prof. Dr Philip Kumanov, Editor-in-chief:
phkumanov@lycos.com

WITH COPY FOR THE SCIENTIFIC SECRETARY –

Assoc. Prof. Drozdstoj Stoyanov:
stojanovpisevski@gmail.com

Рецензиите следва да се придържат към обективни стандарти на оценка. Лични нападки срещу авторите са неприемливи. Критичните забележки следва да бъдат подкрепени с аргументи.

КОНФЛИКТ НА ИНТЕРЕСИ

Непубликувани материали не могат да бъдат използвани в собствени изследвания на редактора без изричното писмено съгласие на авторите.

Авторите следва да обявят всички финансови или други съществени конфликти на интереси, които могат да окажат влияние върху интерпретацията на техните резултати. Всички източници на финансиране на проведените проучвания следва да бъдат обявени.

Етически съображения по отношение на самите изследвания: всички трудове, които отразяват експерименти с хора следва да бъдат съобразени с етическите норми и регулации, въведени от съответния местна или регионална научна комисия и/или с Декларацията от Хелзинки, ревизия от 2000г. Експериментите с животни следва да бъдат също така съобразени със съответните норми и правила.

След положителна рецензия и одобрение на редколегията, авторите на статията дължат заплащане в размер на 10 лв. за всяка стандартна машинописна страница, с оглед на покриване разноските по ангийска езикова редкация на текста и коректури

ВСИЧКИ МАТЕРИАЛИ ЗА СПИСАНИЕТО СЕ ИЗПРАЩАТ НА ПОСОЧЕНИЯ АДРЕС НА РЕДАКЦИЯТА:

Проф. Д-р Филип Куманов
1431 София, ул. Здраве 2, УСБАЛЕ

ИЛИ НА СЛЕДНИЯ ЕЛЕКТРОНЕН АДРЕС:

Проф. Д-р Филип Куманов, главен редактор:
phkumanov@lycos.com

С КОПИЕ ДО НАУЧНИЯ СЕКРЕТАР –

Доц. Д-р Дроздстой Стоянов:
stojanovpisevski@gmail.com

Търсете

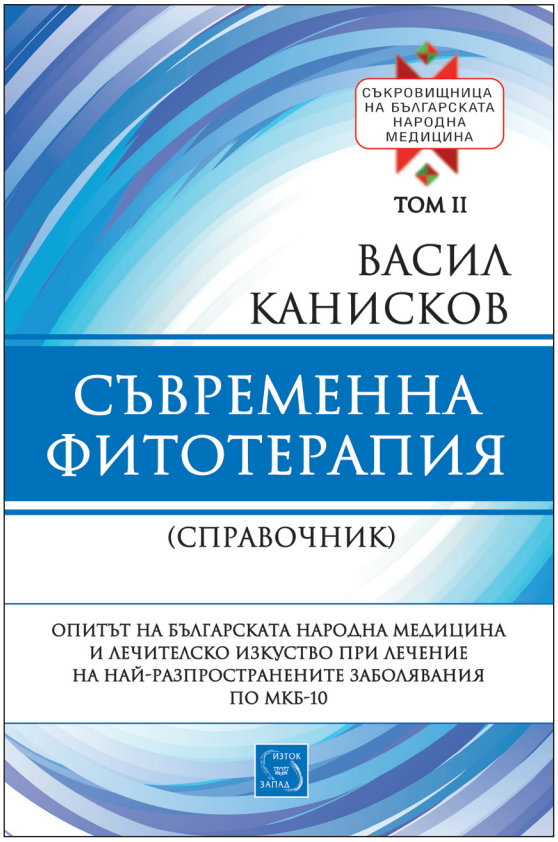

ЕНЦИКЛОПЕДИЯ
НА
ПРИРОДНАТА
МЕДИЦИНА
МАЙКЪЛ МЪРИ
ДЖОУЗЕФ ПИЗОРНО
ИЗТОК
ЗАПАД


ДИПАК ЧОПРА
РУДОЛФ Е. ТАНЗИ
ОСВОБОДЕТЕ НЕОБУЗДАНАТА СИЛА НА УМА СИ,
ЗА ДА ПОСТИГНЕТЕ ДОБРО ЗДРАВЕ, ЩАСТИЕ
И ДУХОВНО БЛАГОДЕНСТВИЕ
СВРЪХМОЗЪКЪТ
ИЗТОК
ЗАПАД


БЕРНХАРД
МЬОЩЪЛ
ПРИНЦИПЪТ НА
ШАОЛИН
ПРАВИ ТОВА,
КОЕТО САМ СИ РЕШИЛ
ИЗТОК
ЗАПАД

Търсете


д-р ПЕТЯ АРНАУДОВА
МАЛКА
МЕДИЦИНСКА
ЕНЦИКЛОПЕДИЯ
ЗА ВСЕКИ
ИЗТОК ЗАПАД


СЪКРОВИЩНИЦА НА БЪЛГАРСКАТА НАРОДНА МЕДИЦИНА
ТОМ II
ВАСИЛ КАНИСКОВ
СЪВРЕМЕННА ФИТОТЕРАПИЯ
(СПРАВОЧНИК)
ОПИТЪТ НА БЪЛГАРСКАТА НАРОДНА МЕДИЦИНА
И ЛЕЧИТЕЛСКО ИЗКУСТВО ПРИ ЛЕЧЕНИЕ
НА НАЙ-РАЗПРОСТРАНЕНИТЕ ЗАБОЛЯВАНИЯ
ПО МКБ-10
ИЗТОК ЗАПАД


КРИС УИЛЯМС
БАРИ РАЙТ
КАК ДА ЖИВЕЕМ С
АУТИЗЪМ
И СИНДРОМ НА
АСПЕРГЕР
ПРАКТИЧЕСКИ
СТРАТЕГИИ ЗА
РОДИТЕЛИ И
СПЕЦИАЛИСТИ
ДЕТЕТО ЗДРАВЕТО СВЕТА
ИЗТОК ЗАПАД