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Title: Functional Constipation in Healthcare Professionals at a University Hospital

Running Head: Constipation in Healthcare Professionals

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ABSTRACT

Objective: In this study, our objective was to determine the frequency of functional constipation, which is a common form of the functional gastrointestinal disorders, in the healthcare professionals.

Materials and Methods: In this study, a survey based on the Rome III criteria was conducted with the personnel working in the xxx University in order to determine the frequency of functional constipation. The survey was mainly focused on the night shift personnel. For statistical analysis, $p < 0.05$ was considered as significant.

Results: A total of 217 individuals participated and evaluated in the survey. The mean age of the participants was 30.08 ± 7.83 years and the 148 of them were females (68.2 %). 73 of these participants (33.2 %) complained of constipation and 47 (21.7 %) stated that they were smokers. 57 of the participants (79.2 %), who complained of constipation, were females ($p < 0.05$); 41 of them were married (56.9 %) ($p < 0.05$). 115 of the participants (53 %) had night shift averagely 7.63 ± 2.72 nights per months and 42 of them (36.5 %) complained of constipation ($p > 0.05$). However, only one-fourth of the participants with constipation were using laxative agents. 23.6 % of the participants with constipation stated that their family members had similar complaints ($p < 0.05$).

Conclusion: The results of this study showed that one-third of the healthcare personnel of the university hospital had constipation. We concluded that the productivity of the healthcare personnel, who have an important role in the examination and treatment process of the patients, will increase with training about functional constipation.

Keywords: Functional constipation, healthcare professionals, university hospital

INTRODUCTION

Constipation is one of the most common gastrointestinal disturbances in the general population. It also affects the quality of life, social life and work performance of the patients. It affects the daily life of the individuals negatively due to the decrease in the quality of life, workforce loss and other medical problems (1-3). In general, constipation is defined as 2 or less than 2 stools per week and the patients have difficulty during defecation and have the feeling of incomplete defecation. In individuals, who have the habit of delayed defecation, the time of the feces passage is prolonged and

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consequently, the absorption of the fecal water is increased and the stool becomes hard and dry. As the defecation process is painful, the individual tends to avoid defecation and thus a vicious circle occurs. If this condition remains untreated in the childhood, it persists in the adulthood and has a negative impact on the daily life of the individual. Moreover, as it can be a finding of the irritable bowel syndrome, it should be considered during the differential diagnosis.

The healthcare workers have an intensive work pace. Delaying of the defecation due to the workload during the working hours is also a common problem. Functional constipation may develop as a result of the stool-holding behavior. The night shift healthcare personnel in our hospital (assistants, nurses, caregivers) are at the risk of functional constipation. Functional constipation is defined as a decrease in the defecation frequency and an increase of the stool stiffness without the presence of an organic disorder. According to the Rome III criteria of functional constipation, 1-Must include two or more of the following: a) Straining during at least 25 % of defecations, b) Lumpy or hard stools in at least 25 % of defecations, c) Sensation of incomplete evacuation for at least 25 % of defecations, d) Sensation of anorectal obstruction/blockage for at least 25 % of defecations, e) Manual maneuvers to facilitate at least 25 % of defecations, f) Fewer than three defecations per week 2- Loose stools are rarely present without the use of laxatives 3- Insufficient criteria for irritable bowel syndrome. According to the Rome III criteria, these findings should be fulfilled for the last 6 months with symptom onset at least 3 months prior to diagnosis (6). According to the Rome IV criteria, which were updated in 2016, the functional bowel disorders are not a separate entity and may overlap considerably (7).

In this study, our objective was to determine the frequency of functional constipation among the healthcare personnel of our hospital with a survey and to increase their attention to this topic.

MATERIALS and METHODS

This cross-sectional study was conducted particularly with the night shift personnel (research assistant, nurse, patient caregiver) of the xxx University Hospital, Department of Pediatric Gastroenterology between January 2016 and April 2016. The survey form was handed out to the participants and they were asked to fulfill it. The participants were informed personally by the specialist physician, who conducted the survey. The survey was conducted on a volunteer basis. Only a total of 236 participants agreed to answer the questionnaire and completed the survey. Based on the survey data of the participants, those with functional constipation according to the Rome III criteria were determined and participants were included in the study without any additional

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systemic disease or organic bowel disease (Crohn disease, ulcerative colitis, etc) or irritable bowel syndrome.

Survey

The survey contained questions about the gender, age, number of night shift per month, number of the cigarettes in case of being a smoker, marital status, the age of onset of constipation, the presence of staining during defecation, the presence of lumpy or hard stools, sensation of incomplete evacuation, sensation of anorectal obstruction/blockage, presence of manual maneuvers to facilitate defecations, stooling frequency per week (as more or less than 3 times per week), duration of the defecation complaints, laxative usage, frequency of defecation with laxative, presence of anorectal lesions (hemorrhoid, fissure, fistula), presence of a systemic disease and presence of a bowel disorder in the family. The presence of recurrent abdominal pain related to defecation at least 3 days/month was also asked to distinguish irritable bowel syndrome with predominant constipation. The questions about the defecation were prepared according to the Rome III criteria.

This study was approved by the Ethics Committee of the xxx University (22.12.2015/22/09).

Statistical Analysis

The data were evaluated with the statistical package for social sciences, version 22.0 (IBM SPSS Corp., Armonk, NY, USA). The descriptive statistical variables were given as unit number (n), percentage (%), mean±standard deviation ($\bar{x} \pm ss$), minimum value, maximum value, median (M), 25 percentage (Q₁) and 75 percentage (Q₃) values. The normal distribution of the numerical data was evaluated with the Shapiro Wilk normality test and showed with the Q-Q graphics. Mann-Whitney U test was used because the data was not distributed normally. The Pearson Chi-square exact test for RxC tables was used in the comparison of the categorical variables. The accepted limit of significance was $p < 0.05$.

RESULTS

A total of 236 healthcare personnel of the xxx University Hospital accepted to participate in the survey and they fulfilled the form completely. 19 participants, who had a systemic disease

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(hyperlipidemia, hypothyroidism, hypoparathyroidism, asthma, hypertension, epilepsy, migraine, multiple sclerosis, celiac disease, hyperthyroidism, ankylosing spondylitis, polycystic ovary syndrome, irritable bowel syndrome, diabetes mellitus), were excluded from the study. Those who responded positively the question of the presence of recurrent abdominal pain related to defecation at least 3 days/month were excluded, also. The remaining 217 people were included in the evaluation. The mean age of the participants was 30.08 ± 7.83 years and the 148 of them were females (68.2 %) and 69 (31.8 %) males. 72 of these participants (33.2 %) complained of constipation and 47 (21.7 %) stated that they were smokers. The mean consumption was 14.70 ± 9.36 cigarettes per day among smokers. 19 of the smokers (26.4 %) had also constipation ($p > 0.05$). The average age of the participants with constipation was 31.19 ± 7.12 years and 29.53 ± 8.13 years among participants without constipation. The participants with the complaint of constipation were older than the participants without complaint ($p < 0.05$). The average age of the onset of the constipation was 21.20 ± 8.10 years. Furthermore, the mean duration of the constipation was 7.66 ± 6.41 years. 57 of the participants (79.2 %), who complained from constipation, were females and 15 were males (20.8 %) ($p < 0.05$); 41 of them were married (56.9 %) and 31 were single (43.1 %) ($p < 0.05$). 115 of the 217 participants (53%) had a night shift. The night shift personnel had 7.63 ± 2.72 night duty per month on average (1-13 night duty/month). 42 of these 115 participants (36.5%) complained of constipation. Only 30 of the participants, who did not have night shift (29.4 %), complained of constipation. There was no significant correlation between night shift and constipation ($p > 0.05$).

The stooling duration among the participants complaining of constipation was 10 (5-15) minutes. The same time was three minutes (3-5 minutes) among the participants without constipation ($p < 0.05$). Among the participants with constipation, 18 (25 %) were using laxatives, 9 (12.5 %) was drinking stool softening herbal teas and the remaining 45 participants stated that they did not use any medication or herbal supplements. The frequency of laxative use was 3.75 ± 1.71 days per week among the laxative users.

54 of the total participants (24.9 %) had an anorectal lesion (hemorrhoid, fissure, fistula). 34 participants with an anorectal lesion had also complained of constipation (63 %). 38 of the participants with constipation has also an anorectal lesion (% 52.8) ($p < 0.05$). 32 of the participants with an anorectal lesion had hemorrhoid (59.2 %), 19 had an anal fissure (35.2 %) and 3 had a fistula (5.5 %).

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26 of the participants (12 %) had constipation and/or bowel disorders among family member(s). 17 of the participants with constipation (23.6 %) had bowel disease in the family and only 9 of the participants without constipation (6.2 %) had a positive family history for the bowel disease ($p<0.05$). Demographic data of healthcare professionals with and without constipation is shown in Table 1.

DISCUSSION

In this study, we investigated the frequency of functional constipation in the healthcare workers of a university hospital. Functional constipation is a common bowel disorder worldwide. Functional constipation, which is more often encountered during the toilet training in the childhood and at school starting age, may persist in the adulthood if not properly managed. The prevalence of functional constipation is higher in Western countries (14-29 %) than the Asian region (3-12 %), for example, the prevalence in China is 6 % (1). In Turkey, Elmas et al. (9) have conducted a study with 3214 individuals from 20 cities and have reported the prevalence as 8.3 %.

There are only a limited number of studies focused on functional constipation in healthcare providers in the literature. Zhou et al. (8) showed that functional constipation is more common in night shift nurses, who could not sleep adequately, than in day shift nurses. Zhen Lu et al. (12) diagnosed constipation in 13 % of 60 nurses and in 24 % of 58 nurses, who had 4-8 times night shift per month. In our country, Uysal et al. (10) conducted a study with 284 students of the high school of nursing and reported that 56.7 % were considered as constipated and 87.7 % had at least two of the Rome II criteria. It was stated in the same study, that exercise and smoking habit did not affect the frequency of constipation. In another study, it was emphasized that one-sixth of the individuals, who quit smoking, became constipated (11). We did not detect any correlation between smoking and constipation. In addition, we determined that night shift was not a role-playing factor in constipation. The percentage of the individuals, who complained of constipation, was 36.5 % among night shift and 29.4 % among day shift personnel. Although the rate of constipation was higher among night shift personnel than the day shift personnel, the difference was not statistically significant. Although it had been reported in some previous studies that lack of sleep increased the rate of complaints of constipation, we had completely contradictory results. These findings indicated that constipation was a widespread complaint among the healthcare workers of our hospital.

A request for the fulfillment of a survey form is usually refused by workers of a hospital, who are in a busy working pressure, as they consider this request as an extra workload. In our study, in order to

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encourage the participation, we prepared a one-sheet questionnaire and the briefing was done personally by the specialist physician, who conducted the study. The workers of the surgical departments refused to participate in the survey due to the workload. Therefore, we conducted our survey only with the workers of the internal branches.

Constipation is more common in females than in males (14). The rate of the pelvic floor dysfunction, which can be seen in all ages, increases with age and it paves the way for constipation (15).

Constipation may emerge as a result of the inhibition of the motilin secretion due to the increase of the progesterone level particularly during pregnancy, of the increase of the absorption of the water and sodium in kidneys and bowel caused by the aldosterone, which is activated by the renin-angiotensin system, which is again induced by estrogen and progesterone (13). In our study, 68.2% of the participants were females and also the majority of the participants with constipation was females and more than half was married.

The mean defecation time was 10 minutes in participation with constipation and 3 minutes without constipation. The toilets for patients/relatives and healthcare workers are usually separated in hospitals. The toilets for healthcare personnel are generally cleaner than the toilets for general use and thus the healthcare personnel is more comfortable. However, they are usually in hurry due to the time pressure. This condition is a factor, that aggravates the development of constipation if the individual has an inclination to constipation.

Following a usual examination, physicians recipe a laxative to the patients, who have applied with the complaint of constipation and schedule control visits. As laxatives have side effects like abdominal cramps and disturbances, the patients' compliance with the treatment is rather low. In a study involving different countries, the rate of the laxative usage was 16 % in South Korea and 40 % in the USA among the adults with constipation (17). In our study, one-fourth of the participants with constipation stated that they were using laxative agents. 12.5 % of the participants preferred to use stool-softening herbal teas instead of drugs. A large majority (62.5%) of the participants with constipation used neither medication nor herbal supplements. For a population working in the health sector, this rate was considered as too much. The reason for this finding might be the avoidance of an anorectal examination and of visiting a physician and fear of laxative addiction.

In defecation disorders, anorectal structural problems like fissure, fistula and hemorrhoid may emerge due to the stress in the rectum (16). In a study, it was determined that hemorrhoid is the most common anal lesion in individuals with constipation (18). In our study, most common lesions in

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individuals with anorectal lesion were hemorrhoid and anal fissure respectively. More than half of the individuals with constipation stated that they had an anorectal lesion. Even constipation alone is a condition impairing the individual's working performance. A concomitant anorectal lesion will increase significantly the stress of the individual.

Regarding the predisposing factors in functional bowel disorders, the family history has an critical importance. As a result of the genetic basis and the learned behaviors within the family accelerate the development of functional constipation. Chan et al. (19) suggested that constipation emerged at earlier ages in individuals with positive family history and the duration of the constipation was relatively longer in these individuals. In our study, 23.6 % of the participants with constipation had a positive family history in respect of bowel disorders and the same rate was only 6.2 % in the participants without constipation.

In conclusion, we had shown in this study that one-third of the healthcare workers of the university hospital had functional constipation. Furthermore, we had observed that the usage of laxative agents was low even among the healthcare workers. It is obvious that suffering from such a treatable disorder will impair the work performance in an intensive working environment. Training related to constipation may decrease the frequency of this problem among healthcare workers. We believe that working with personnel, who do not have constipation problems, will increase the labor productivity.

REFERENCES

- 1- Zhao YF, Ma XQ, Wang R, Yan XY, Li ZS, Zou DW, et al. Epidemiology of functional constipation and comparison with constipation-predominant irritable bowel syndrome: the systematic investigation of gastrointestinal diseases in China (SILC). *Aliment Pharmacol Ther* 2011; 34: 1020-9.
- 2- Ternent CA, Bastawrous AL, Morin NA, Ellis CN, Hyman NH, Buie WD. Practice parameters for the evaluation and management of constipation. *Dis Colon Rectum* 2007; 50: 2013-22.
- 3- Lembo A, Camilleri M. Chronic constipation. *N Engl J Med* 2003; 349: 1360-8.
- 4- Schiller LR. New treatments for an old problem: chronic constipation. *Adv Stud Med* 2006; 6: 962-7.

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- 5- Tack J, Müller-Lissner S, Stanghellini V, Boeckstaens G, Kamm MA, Simren M, et al. Diagnosis and treatment of chronic constipation- a European perspective. *Neurogastroenterol Motil* 2011; 23: 697-710.
- 6- Longstreth GF, Thompson WG, Chey WD, Houghton LA, Mearin F, Spiller RC. Functional bowel disorders. *Gastroenterology* 2006; 130: 1480-91.
- 7- Schmulson MJ, Drossman DA. What is new in Rome IV. *J Neurogastroenterol Motil* 2017; 23: 151-163.
- 8- Zhou HQ, Yao M, Chen YW, Huang JY, Chen GY. Functional gastrointestinal disorders common among with poor sleep quality in Shanghai, China: a pilot study. *Gastroenterol Nurs* 2017; 40: 312-19.
- 9- Kasap E, Bor S. Fonksiyonel barsak hastalığı prevalansı. *Güncel Gastroenteroloji* 2006; 10(2): 165-68.
- 10- Uysal N, Khorshid L, Eşer İ. Sağlıklı genç bireylerde konstipasyon sorununun belirlenmesi. *TAF Prev Med Bull* 2010; 9: 127-32.
- 11- Hajek P, Gillison F, McRobbie H. Stopping smoking can cause constipation. *Addiction* 2003; 98: 1563-7.
- 12- Zhen Lu W, AnnGwee K, YuHo K. Functional bowel disorders in rotating shift nurses may be related sleep disturbances. *Eur J Gastroenterol Hepatol* 2006; 18: 623-7.
- 13- Verghese TS, Futaba K, Latthe P. Constipation in pregnancy. *Obstet Gynecol* 2015; 17: 111-5.
- 14- Higgins PD, Johanson JF. Epidemiology of constipation in North America: a systematic review. *Am J Gastroenterol* 2004; 99: 750-9.
- 15- Chen G. Pelvic floor dysfunction in aging women. *Taiwan J Obstet Gynecol* 2007; 46: 374-8.
- 16- Gallegos-Orozco JF, Foxx-Orenstein AE, Sterler SM, Stoa JM. Chronic constipation in the elderly. *Am J Gastroenterol* 2012; 107: 18-25.
- 17- Wald A, Scarpignato C, Mueller-Lissner S, Kamm MA, Hinkel U, Helfrich I, et al. A multinational survey of prevalence and patterns of laxative use among adults with self-defined constipation. *Aliment Pharmacol Ther* 2008; 28: 917-30.
- 18- Schmidt FM, Santos VL, DomanskyR de C, Barros E, Bandeira MA, Tenorio MA, et al. Prevalence of self-reported constipation in adults from the general population. *Rev Esc Enferm USP* 2015; 49: 443-52.
- 19- Chan AO, Lam KF, Hui WM, Leung G, Wong NY, Lam SK, et al. Influence of positive family history on clinical characteristics of functional constipation. *Clin Gastroenterol Hepatol* 2007; 5: 197-200.

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Table 1. Demographic data of healthcare professionals with and without constipation

	Personnel with constipation (n=72) (%)	Personnel without constipation (n=145) (%)	p
Age (years) (M (Q ₁ - Q ₃))	31 (26-36)	28 (23-33)	0.037
Female/male	57 (79.2)/15 (20.8)	91 (62.8)/54 (37.2)	0.020
Married	41 (56.9)	55 (37.9)	0.009
Smokers	19 (26.4)	28 (19.3)	0.290
Night shift personnel	42 (58.3)	73 (50.3)	0.310
Duration of defecation (min) (M (Q ₁ - Q ₃))	10 (5-15)	3 (3-5)	<0.001
Personnel with anorectal lesion	34 (47.2)	20 (13.8)	<0.001
Personnel with positive family history for constipation	16 (22.2)	9 (6.2)	<0.001

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