Original Article

Hemorrhoids and Constipation in Bangkok Monks

Techathuvanan K, MD[1]

[1] Division of Gastroenterology, Department of Internal Medicine, Faculty of Medicine Vajira Hospital, Navamindradhiraj University, Bangkok, Thailand

Objective: To assess the prevalence and associated factors of constipation and hemorrhoids in urban Buddhist monks.

Materials and Methods: This cross-sectional study included monks living in temples in Dusit and Nong Chok districts of Bangkok between March and November 2017. Demographic and health data including bowel habit, problems of defecation, eating habit, daily lifestyle, and physical examinations as well as laboratory data were collected. Factors associated with constipation and hemorrhoids were determined.

Results: Among 174 monks included in the study, 36 monks (20.7%) had defecation problems. The prevalence of constipation and hemorrhoids were 15.5% and 4%, respectively. Monks with constipation tended to be older than those without the problem (50.7±22.6 years and 43.1±17.9 years; $p = 0.051$). Other findings which were more common among the monks with constipation than the other monks were: higher frequency of tea or coffee drinks (33.3% vs. 17%; $p = 0.049$), having osteoarthritis of knee (11.1% vs. 2%; $p = 0.049$) and creatinine level ≥1 mg/dL (51.9% vs. 32%; $p = 0.047$). On the other hand, monks with hemorrhoids were significantly older (62.7±17.9 years vs. 43.5±18.5 years; $p = 0.008$) and had more hypertension (71.4% vs. 12.6%; $p = 0.001$), dyslipidemia (42.9% vs. 7.8%; $p = 0.018$), and heart diseases (28.6% vs. 1.8%; $p = 0.013$) than those without hemorrhoids. Only hypertension was an independent associated factor with hemorrhoids in multivariable analysis.

***Conclusion*:** Approximately 1/5 of Thai monks living in Bangkok had defecation problems. Several associated factor with constipation and hemorrhoids were identified. Older age was a common factor for both conditions. Lifestyle modification including having high fiber diet, minimize tea or coffee consumption and good control of other medical illnesses may alleviate the defecation problems.

Keywords: Constipation, Hemorrhoids, Monk

J Med Assoc Thai 2019;102(Suppl.8): 27-32
Website: http://www.jmatonline.com

Buddhism is the main religion among Thai. Monk is an ordained male monastic in Buddhism. Monkhood is regarded as an honor to one's life and considered highly in the society. The Buddhist monk dedicates their livings to preserve the doctrine of the Buddha and to teach Dharma to people. They must follow the Buddhist Monk's Discipline, 227 strict rules to live with minimum possessions. Daily activities of the monks are different from general people, including eating habit, physical activity, and duties in the temple. These activities are, somewhat, limited by certain regulations. According to eating, monks are not able to choose but to take any food as the alms received. Most monks have two meals in morning and before noon. Only liquid drinks are allowed in the afternoon when all solid foods are prohibited until sunrise of the following morning. Chanting and meditation are performed in every morning and evening; these generally require siting position and without active movement for hours. These unique daily activities may affect the monk's health.

Previous study reported over a half of Thai monks had underlying diseases and one-third had chronic medical conditions[1]. Gastrointestinal and liver diseases are important health problems among the monks[1,2]. Previous study, which found peptic ulcer disease as a frequent upper gastrointestinal illness, revealed its associated factors were older age, *H. pylori* infection, NSAID use, smoking, and duration of ordination[3]. Among lower gastrointestinal tract conditions, constipation is one of the most frequent problems. A recent systematic review and meta-analysis of worldwide data reported 11 to 18% chronic constipation in general population[4]. In Thailand, Danvivat, et al reported 23% of Thai population described themselves as having constipation, 8% had to strain at defecation, and 3% had less than 3 bowel movements per week[5]. Having hemorrhoids is another important problem having common risk factors and is frequently associated with constipation.

Various factors are found associated with constipation and/or hemorrhoids: inadequate fiber or fluid intake, primary colonic disorders including colonic inertia, lack of regular exercise, sedentary lifestyle, pelvic floor dysfunction, and secondary causes such as metabolic or neurological diseases, and certain drugs[6]. Many of these risk factors are frequently found in monks, such as, straining and prolonged upright posture[7].

There is currently no study about constipation and hemorrhoids in monk in Thailand. Our institute is

Correspondence to:

Techathuvanan K.

Department of Internal Medicine, Faculty of Medicine Vajira Hospital, Navamindradhiraj University, Bangkok 10300, Thailand.

Phone: +66-2-2443461

E-mail: karjtech@gmail.com

How to cite this article: Techathuvanan K. Hemorrhoids and Constipation in Bangkok Monks. J Med Assoc Thai 2019;102(Suppl.8): 27-32.

responsible for health promotion and care of people in Bangkok, the largest city of Thailand which have different ways of living from rural towns. Therefore, we aimed to assess prevalence and associated factors of constipation and hemorrhoids in urban Buddhist monks.

Materials and Methods

Study population

This cross-sectional study was conducted after approval of the Ethical Committee for Human Research of Faculty of Medicine Vajira Hospital, Navamindradhiraj University. Data were collected from monks living in temples in Dusit and Nong Chok districts of Bangkok from March 2017 to November 2017. Inclusion criteria were Thai monks who aged 20 years old and above, having been ordinated for at least 1 year, and literate in Thai. The monks who were not willing to participate were excluded.

Data collection

Data collection comprised of 3 parts, including general demographic and history health data collected by self-administered questionnaire which covered bowel habit, problem of defecation, eating habit, and daily lifestyle. The second part was physical examination included vital signs, body measurement and general examination. The third part was laboratory tests consisting of complete blood count and blood chemistry (fasting blood sugar, lipid profiles, liver and renal function tests). Data of constipation and hemorrhoids were obta ined only from the questionnaires. Before answering the questionnaire, the definition of constipation and hemorrhoids were briefly described to the monks. Constipation is defined as frequency of bowel movement less than 3 times per week[8]. Those who had persistent symptoms more than 3 months are described as chronic constipation. Hemorrhoids are enlargement and distal displacement of normal anal cushions[9], which cardinal features of bleeding, anal pruritus, prolapse or pain due to thrombosis.

Statistical analysis

Data were analyzed using SPSS 22.0 statistical software (IBM Corporation, Armonk, NY, USA). Descriptive statistics were used to analyze demographic data and were summarized as number with percentage, mean with standard deviation (SD). Student t-test was used for two-group comparisons for continuous variables, and Chi-square test was used for categorical variables. In regression analysis, factors with $p<0.01$ were included as covariates in the model and analyzed by Hosmer and Lameshow test, goodness of fit $p = 0.845$ for constipation, and $p = 0.374$ for hemorrhoids. The p-value <0.05 was considered statistically significant.

Results

From 224 monks in 16 temples within Dusit and Nong Chok districts of Bangkok, 50 monks were excluded from the analysis: 24 individuals who had no answers about defecation problems, 14 cases of incomplete questionnaire of related factors, and 12 cases due to no laboratory investigation as associated factors of the defecation problems. Demographic data of 174 monks included for analysis are shown in Table 1. More than half or 96 monks (55.2%) stayed in temples within Dusit district and the other 78 (44.8%) in Nong Chok district. The mean age was 44.3±18.8 years, with 50% had been ordinated for more than 5 years. Nearly 3/4 or 126 monks (72.3%) completed education in high school or university. Monks graduated in or Dhamma scholar or Buddhist theology (134 monks or 77%). Approximately 1/3 monks were current cigarette smokers (63 monks or 36.2%) or reported some kinds of underlying diseases (66 monks or 37.9%). Hypertension, diabetes and dyslipidemia were the 3 most common diseases.

Defecation problems were reported in 36 monks (20.7%). Constipation was the most common complaint of defecation problems (15.5%) and 5 of 27 monks needed

Table 1. Demographic data of 174 monks in Dusit and Nong Chok districts

Characteristics	Total 174 monks
Age (years)	44.3±18.8
>60 years	35 (20.1)
Ordination as monk (years)	10.4±12.7
≥5 years	87 (50)
Previous education	
Elementary school	42 (24.1)
High school	77 (44.2)
University	49 (28.1)
Buddhist education	
No education	37 (21.3)
Dhamma scholar	104 (59.8)
Buddhist theology	30 (17.2)
Underlying diseases	
Diabetes	21 (11.5)
Hypertension	26 (14.9)
Dyslipidemia	16 (9.2)
Heart diseases	5 (2.9)
Cerebrovascular diseases	1 (0.6)
Hemorrhoids	7 (4)
Fatty liver disease	2 (1.1)
Osteoarthritis of knee	6 (3.4)
Defecation problems	36 (20.7)
Constipation	27 (15.5)
Bleeding per rectum	3 (1.7)
Lumpy or hard stool	1 (0.6)
Sensation of incomplete evacuation or anorectal blockage	6 (3.4)
Maneuvers for facilitate defecation	5 (2.9)
Body mass index; BMI (kg/m^2)	25.6±5
Underweight (BMI <18.5 kg/m^2)	10 (5.7)
Overweight (BMI 23 to 24.99 kg/m^2)	29 (16.7)
Obesity (BMI ≥25 kg/m^2)	92 (52.9)
Waist circumference (cm)	83.7±13
Abdominal obesity (WC ≥90 cm)	41 (23.6)

Data are presented as n (%) or mean ± SD

specific maneuvers for bowel movement (digitization, laxative, or enema). 7 (4%) had hemorrhoids and 3 (1.7%) had history of bleeding per rectum.

Lifestyle questionnaires showed median (IQR) of daily exercise, temple cleaning and Dhamma studying duration were 30.0 (22.5, 30.0) minutes, 37.5 (30.0, 60.0) minutes and 60 (32.5, 60.0) minutes respectively. Regarding the eating behavior, answers from the questionnaires revealed 168 of 174 monks (96.6%) had food provided as the alms. Daily meals composed of medium to large amount of fatty (55.2%), fried (60.3%) and salty food (42%). Moderate to large amount of sweets (33.9%), pickled food intake (24.7%) and tea drinking (46.5%) were revealed. Moderate to high fiber eating was 85.0%. Frequent 6 to 8 glasses of water drinking per day was 89.7%. Around 1/3 or 54 of 174 monks (31%) had history of continuous analgesics usage more than 1 month and the most common reason for usage was headache (43.7%).

Mean body weight, body mass index (BMI), and waist circumference were 70.9±16.8 kg, 25.6±5 kg/m^2, and 83.7±13 cm, respectively. Nearly 70.0% of the monks were overweight or obesity. Mean systolic and diastolic blood pressure were 132.5±18.9 mmHg and 80.5±13.3 mmHg.

Laboratory examinations revealed marginal or slightly elevated fasting blood sugar, cholesterol, triglyceride, LDL and creatinine: 104.5±46.3 mg/dL, 205.1±49.3 mg/dL, 157.5±100.4 mg/dL, 142.3±42.1 mg/dL and 0.99±0.3 mg/dL, respectively.

Factors associated with constipation and hemorrhoids were studied. Age of monks with and without constipation were 50.7±22.6 years and 43.1±17.9 years (p = 0.051). According to lifestyle, active and sedentary lifestyles were not different in both groups. Diet components including pickled food, fatty or fried foods, raw or half-cooked materials, high fiber diet were not different in two group, except constipation group had higher frequency of tea or coffee drinks than non constipation group (33.3% vs. 17%; p = 0.049) (Table 2). For personal illnesses, osteoarthritis of knee was found more common in the monks with constipation than the others (11.1% vs. 2.0%; p = 0.049). Others underlying diseases, BMI and waist circumference were comparable between both groups. Monks with constipation had creatinine level ≥1 mg/dL more than without ones (51.9% vs. 32%; p = 0.047).

Monks with hemorrhoids were older than the monks without the condition (62.7±17.9 years vs. 43.5±18.5 years; p = 0.008). Hemorrhoids group had underlying diseases of hypertension, dyslipidemia and heart diseases more than no hemorrhoids group (71.4% vs. 12.6%; p = 0.001, 42.9% vs. 7.8%; p = 0.018, and 28.6% vs. 1.8%; p = 0.013 respectively). Body weight, BMI, waist circumference and

Table 2. Factors associated with constipation

Variables	Constipation (n = 27)	No constipation (n = 147)	p-value
Age (years)	50.7±22.6	43.1±17.9	0.051
Age >60 years	10 (37)	25 (17)	0.017
Underlying diseases			
Diabetes	5 (18.5)	15 (10.2)	0.320
Hypertension	6 (22.2)	20 (13.6)	0.337
Dyslipidemia	2 (7.4)	14 (9.5)	1.000
Heart diseases	2 (7.4)	3 (2)	0.172
Cerebrovascular diseases	0 (0)	1 (0.7)	1.000
Osteoarthritis of knee	3 (11.1)	3 (2)	0.049
Body mass index; BMI (kg/m^2)	24.2±4.2	25.9±5.1	0.107
Underweight	3 (11.1)	7 (4.8)	0.365
Overweight or obesity	16 (59.3)	105 (71.4)	0.207
Obesity	13 (48.1)	79 (53.7)	0.593
Waist circumference (cm)	81.2±11.9	84.2±13.3	0.342
Abdominal obesity (WC ≥90 cm)	6 (22.2)	35 (23.8)	0.858
Daily lifestyle			
Active behavior (minutes)	60±41.5	51.1±47.2	0.490
Sedentary behavior (minutes)	120.8±103.9	91.5±82.4	0.846
Eating habits in high frequency/amount			
Fatty food	5 (18.5)	24 (16.3)	1.000
Raw/half cooked food	2 (7.4)	8 (5.4)	1.000
High fiber diet	9 (33.3)	49 (33.3)	1.000
6 to 8 glasses of water	18 (66.7)	91 (61.9)	0.638
Tea or coffee drinks	9 (33.3)	25 (17)	0.049
pickled food	2 (7.4)	7 (4.8)	0.632
Fried food	4 (14.8)	34 (23.1)	0.336
Sweets/dessert	1 (3.7)	11 (7.5)	0.694

Data are presented as n (%) or mean ± SD

laboratory results were similar in both groups. Laboratory results (FBS, lipid profiles and creatinine) were comparable (Table 2).

Table 3 and 4 show odd ratios (ORs) of constipation and hemorrhoids according to clinical features of the monks. By univariable analysis, an increased risk of constipation was significantly associated with age ≥60 years (OR = 2.87), osteoarthritis of knee (OR = 6), serum creatinine ≥1 mg/dL (OR = 2.29), and frequent tea or coffee drinking (OR = 2.44) (p<0.05 for all). On the other hand, the risk of

Table 3. Factors associated with hemorrhoids

Variables	Hemorrhoids (n = 7)	No hemorrhoids (n = 167)	p-value
Age (years)	62.7±17.9	43.5±18.5	0.008
Age >60 years	4 (57.1)	31 (18.6)	0.031
Underlying diseases			
Diabetes	1 (14.3)	19 (11.4)	1.000
Hypertension	5 (71.4)	21 (12.6)	0.001
Dyslipidemia	3 (42.9)	13 (7.8)	0.018
Heart diseases	2 (28.6)	3 (1.8)	0.013
Cerebrovascular diseases	0 (0)	1 (0.6)	1.000
Osteoarthritis of knee	0 (0)	6 (3.6)	1.000
Body mass index; BMI (kg/m^2)	25.2±3	25.6±5.1	0.813
Underweight	0 (0)	10 (6)	1.000
Overweight or obesity	5 (71.4)	116 (69.5)	1.000
Obesity	3 (42.9)	89 (53.3)	0.708
Waist circumference (cm)	86.4±9.9	83.6±13.2	0.752
Abdominal obesity (WC ≥90 cm)	2 (28.6)	39 (23.4)	1.000
Daily lifestyle			
Active behavior (minutes)	39.4±28.2	53.9±49.3	0.155
Sedentary behavior (minutes)	89±56.7	93.2±87.6	0.594
Eating habits in high frequency/amount			
Fatty food	2 (28.6)	27 (16.2)	0.602
Raw/half cooked food	1 (14.3)	9 (5.4)	0.344
High fiber diet	3 (42.9)	55 (32.9)	0.687
6 to 8 glasses of water	2 (28.6)	107 (64.1)	0.104
Tea or coffee drinks	2 (28.6)	32 (19.2)	0.624
pickled food	1 (14.3)	8 (4.8)	0.315
Fried food	1 (14.3)	37 (22.2)	0.702
Sweets/dessert	0 (0)	12 (7.2)	1.000

Data are presented as n (%) or mean ± SD

Table 4. Crude and adjusted odds ratios of constipation according to associated factors

Factors	Constipation	No constipation	Crude OR (95% CI)	Adjusted OR* (95% CI)
Age (years)				
<60	17 (63)	112 (83)	1.00	1.00
≥60	10 (37)	25 (17)	2.87 (1.18 to 7.00)	2.11 (0.80 to 5.57)
OA knee				
No	24 (88.9)	144 (98)	1.00	1.00
Yes	3 (11.1)	3 (2)	6 (1.14 to 31.48)	2.90 (0.48 to 17.63)
Creatinine (mg/dL)				
<1	13 (48.1)	100 (68)	1.00	1.00
≥1	14 (51.9)	47 (32)	2.29 (1.00 to 5.26)	2.19 (0.84 to 5.71)
Tea/coffee drinks				
No	18 (66.7)	122 (83)	1.00	1.00
Yes	9 (33.3)	25 (17)	2.44 (0.98 to 6.05)	2.10 (0.89 to 4.98)

* Adjusted for the other variables in the table
CI = confidence interval, OR = odds ratio

Table 5. Crude and adjusted odds ratios of hemorrhoids according to associated factors

Factors	Hemorrhoids	No hemorrhoids	Crude OR (95% CI)	Adjusted OR* (95% CI)
Age (years)				
<60	3 (42.9)	136 (81.4)	1.00	1.00
≥60	4 (57.1)	31 (18.6)	5.85 (1.25 to 27.48)	1.47 (0.21 to 10.24)
Heart disease				
No	5 (71.4)	164 (98.2)	1.00	1.00
Yes	2 (28.6)	3 (1.8)	21.87 (2.97 to 161.29)	5.95 (0.50 to 71.07)
Hypertension				
No	2 (28.6)	156 (87.4)	1.00	1.00
Yes	5 (71.4)	21 (12.6)	17.38 (3.17 to 95.37)	9.21 (1.25 to 67.98)
Dyslipidemia				
No	4 (57.1)	154 (92.2)	1.00	1.00
Yes	3 (49.2)	13 (7.8)	8.89 (1.79 to 44.02)	2.29 (0.33 to 15.97)

* Adjusted for the other variables in the table
CI = confidence interval, OR = odds ratio

hemorrhoids was related with age ≥60 years (OR = 5.85), concomitant with heart disease (OR = 21.87), hypertension (OR = 17.38) and dyslipidemia (OR = 8.89) (p<0.05 for all). After adjustment for potential confounding factors by multivariable analysis, these factors shoed a trend to associate with constipation. Only hypertension was a significant risk factor for hemorrhoids (OR = 9.21).

Discussion

Constipation is a common gastrointestinal disorder. Systematic review and meta-analysis reported prevalence of chronic constipation was 11 to 18% worldwide[4]. In Thailand, Danvivat, et al reported 8% of Thai population had a problem of straining at defecation, and 3% had less than 3 bowel movements per week[5]. The 20.7% prevalence of overall defecation problems and 15.5% of constipation in this study were higher than general Thai population in previous studies[4,5]. The 1.7% prevalence of hemorrhoids in this study was slightly lower than 4.4% reported in a previous epidemiologic study by Johanson et al[10]. To be noted, the actual prevalence of hemorrhoids may be under reported and was difficult for evaluation because the condition may be unrecognized by the monks themselves.

Factors associated with constipation in the present study were advanced age, osteoarthritis of knee, renal insufficiency, and habit of tea/coffee drinking. These findings were concordant to prior survey by Sandler et al which reported age over 60 years and higher consumption of tea of coffee were related to constipation[11]. Diet high in fiber which has been regarded as major determinant of constipation was generally consumed in only 1/3 of the monks in this study. Osteoarthritis of knee might be associated with constipation as a result of limitation movement and exercise or analgesic medication. Common secondary causes of constipation were diabetes and cerebrovascular diseases which may subsequently slow transit of the large intestine[12]. This study found an association between diabetes and constipation but not at a significant level (18.5% vs. 10.2%, p = 0.32).

One important pathogenesis of hemorrhoids is deterioration of the connective tissue that anchors hemorrhoids; this was hypothesized to occur with advancing age[13]. This was also demonstrated in this study that old age was an important risk factor of hemorrhoids. Other factors associated with hemorrhoids were atherosclerotic conditions including dyslipidemia, hypertension, and heart diseases. Recent studies also addressed the association between hemorrhoid and coronary heart disease as well as peripheral artery occlusive disease[14,15]. Possible reasons for these relationships may be from common risk factors of the conditions, such as, high fat diet or sedentary lifestyle.

The present study had strength that it was the first report of defecation problems and constipation in Thai monks. The association of these modifiable factors and defecation problems demonstrated in this study should be recognized and be aware among the monks themselves and health care providers. Lifestyle modification of the monks and the attendants should be carried out to prevent or minimize constipation and/or hemorrhoids. Regarding the eating habit, providing knowledge and setting out a campaign to laymen to provide healthy, high fiber foods to the monks should be organized. The authorities involving the monk health promotion may encourage appropriate physical activities and exercise into monk's daily schedule. Non-communicable diseases should be screened as common risk factors with defecation problems particularly hemorrhoids. Defecation problems should be assessed in elderly monks during annual or regular health surveillance due to its higher prevalence.

Few limitations of the present study were recognized. Only the temples in 2 districts of Bangkok were arbitrarily included. Small number of monks with hemorrhoids may result in inadequate power to detect other associated risk factors. Further studies with larger number of monks and in different areas of Bangkok are needed to confirm the association. Knowledge, prevention and correction of these

defecation problems will improve overall health of the monks in urban area of the country.

Conclusion

The prevalence of constipation was high in Thai monks. Advanced age was associated with both constipation and hemorrhoids. Lifestyle modification including heathy diet with high fiber food and decrease tea or coffee consumption should be encouraged. Acknowledgement of this information by alms devotees is important. Health promotion, control of medical illnesses, and screening of defecation problems should be carried out for the monks.

What is already known in this topic?

Prevalence of constipation and hemorrhoids varies across geographic area and ethnicities. The elderly population had higher incidence of constipation than the younger ones. Thai Buddhist monks had unique eating habit and daily activity and had multiple medical conditions including gastrointestinal problems.

What this study adds?

There was high prevalence of defecation problems especially constipation in Thai monks. Age is a common factor for constipation and hemorrhoids. Aside from aging, multiple atherosclerotic conditions such as dyslipidemia, hypertension, and heart diseases are also significantly associated with hemorrhoids in the monks.

Acknowledgements

The present study was granted from research fund of Faculty of Medicine Vajira Hospital. The author would like to thank Professor Siriwan Tangjitgamol, Assistant professor Chadakarn Phaloprakarn and Assistant professor Jiraporn Srion for their kind advice and review of the manuscript.

Potential conflicts of interest

The author declares no conflict of interest.

References

1. Bhumisawasdi V, Takerngdej S, Jenchitr W. The sustained and holistic health care program for the priests Commemoration of His Majesty the King's 60 Years Accession to the Throne (first phase: February to June 2006). J Med Assoc Thai 2008;91 Suppl 1:S1-12.
2. Yiengprugsawan V, Seubsman SA, Sleigh AC. Health, well-being, and social indicators among monks, prisoners, and other adult members of an Open University Cohort in Thailand. J Relig Health 2012;51:925-33.
3. Tantiwattanasirikul P. Peptic ulcer disease in Priest Hospital. J Med Assoc Thai 2008;91 Suppl 1:S53-6.
4. Suares NC, Ford AC. Prevalence of, and risk factors for, chronic idiopathic constipation in the community: systematic review and meta-analysis. Am J Gastroenterol 2011;106:1582-91.
5. Danvivat D, Tankeyoon M, Sriratanabun A. A study of bowel pattern in Thai population. Chula Med J 1988;32:803-9.
6. Forootan M, Bagheri N, Darvishi M. Chronic constipation: A review of literature. Medicine (Baltimore) 2018;97:e10631.
7. Loder PB, Kamm MA, Nicholls RJ, Phillips RK. Haemorrhoids: pathology, pathophysiology and aetiology. Br J Surg 1994;81:946-54.
8. Lembo A, Camilleri M. Chronic constipation. N Engl J Med 2003;349:1360-8.
9. Lohsiriwat V. Hemorrhoids: from basic pathophysiology to clinical management. World J Gastroenterol 2012;18:2009-17.
10. Johanson JF, Sonnenberg A. The prevalence of hemorrhoids and chronic constipation. An epidemiologic study. Gastroenterology 1990;98:380-6.
11. Sandler RS, Jordan MC, Shelton BJ. Demographic and dietary determinants of constipation in the US population. Am J Public Health 1990;80:185-9.
12. Rao SS, Rattanakovit K, Patcharatrakul T. Diagnosis and management of chronic constipation in adults. Nat Rev Gastroenterol Hepatol 2016;13:295-305.
13. Haas PA, Fox TA Jr, Haas GP. The pathogenesis of hemorrhoids. Dis Colon Rectum 1984;27:442-50.
14. Chang SS, Sung FC, Lin CL, Hu WS. Association between hemorrhoid and risk of coronary heart disease: A nationwide population-based cohort study. Medicine (Baltimore) 2017;96:e7662.
15. Hu WS, Lin CL. Hemorrhoid is associated with increased risk of peripheral artery occlusive disease: A nationwide cohort study. J Epidemiol 2017;27:574-7.