Research Article

The Prevalence and Risk Factors of Constipation in Pregnancy

Prevalensi dan Faktor-Faktor Risiko Konstipasi dalam Kehamilan

Andon Hestiantoro, Priska A Baidah

Department of Obstetrics and Gynecology
Faculty of Medicine Universitas Indonesia/
Dr. Cipto Mangunkusumo Hospital
Jakarta

Abstract

Objective: To estimate the prevalence of constipation in pregnancy and correlation between gestational age, dietary fiber intake, water comsumption, and physical activity.

Methods: This study used cross-sectional design with samples of 174 healthy pregnant women undergoing antenatal care at Obstetrics and Gynecology Outpatient Clinic RSCM during August - October 2016. Data were collected using questionnaire. Diagnosis of constipation was based on ROME III criteria, dietary fiber is measured using *Food Frequency Questionnaire* (FFQ), and physical activity was measured using *International Physical Activity Questionnaire* (IPAQ). Chi-square and Fisher's exact test were conducted to evaluate the association between variables.

Results: The prevalence of constipation in pregnant women observed in this study was 13.2% (95% CI 8.3-18.1). The most frequent complaints included straining, incomplete evacuation, and anorectal obstruction. Dietary fiber intake was low in 81.03% subject. with average dietary fiber intake of 18.97 gram/day. There was no significant association between constipation and gestational age (OR 4.36, 95%CI 0.51-37.48 for second trimester and OR 2.04, 95%CI 0.25-16.7 for third trimester), dietary fiber intake (OR 0.82, 95%CI 0.28-2.39), water consumption (OR 1.38, 95%CI 0.56-3.41), and physical activity (OR 1.167, 95%CI 0.28-4.87).

Conclusion: Prevalence of constipation in pregnant women is 13.2%. There is no significant correlation between gestational age, dietary fiber intake, water consumption, and physical activity.

[Indones J Obstet Gynecol 2018; 6-2: 84-88]

Keywords: constipation, pregnant woman, ROME III

Abstrak

***Tujuan**: Mengetahui prevalensi dan hubungan antara usia kehamilan, asupan serat, konsumsi air, dan tingkat aktivitas fisik dengan konstipasi pada ibu hamil.*

***Metode**: Penelitian ini merupakan penelitian potong lintang dengan jumlah sampel 174 perempuan hamil yang sehat yang berkunjung untuk melakukan pemeriksaan antenatal di poliklinik rawat jalan RSCM selama Agustus-Oktober 2016. Data dikumpulkan melalui pengisian kuesioner. Diagnosis konstipasi berdasarkan kriteria ROME III, pengukuran asupan serat dengan kuesioner Food Frequency Questionnaire (FFQ), pengukuran tingkat aktivitas fisik dengan kuesioner International Physical Activity Questionnaire (IPAQ). Uji chi square dan Fisher dilakukan untuk menilai hubungan antar variabel.*

***Hasil**: Prevalensi konstipasi pada perempuan hamil pada penelitian ini 13,2% (IK95% 8,3-18,1) Keluhan tersering yaitu mengedan keras, buang air besar (BAB) yang tidak lampias, dan sensasi tidak dapat mengeluarkan tinja saat BAB. Sebanyak 81,03% subjek asupan serat per harinya kurang dengan rata-rata asupan serat 18,97 gram/hari. Tidak terdapat hubungan yang bermakna antara usia kehamilan (OR 4,36, IK95% 0,51-37,48 untuk trimester 2 and OR 2,04, IK 95% 0,25-16,7 untuk trimester 3), asupan diet harian (OR 0,82, IK95% 0,28-2,39), asupan cairan (OR 1,38, IK95% 0,56-3,41), dan tingkat aktivitas fisik (OR 1,167, IK95% 0,28-4,87).*

***Kesimpulan**: Prevalensi konstipasi pada perempuan hamil sebanyak 13,2%. Tidak terdapat hubungan yang bermakna antara usia kehamilan, asupan serat, konsumsi air, dan tingkat aktivitas fisik.*

[Maj Obstet Ginekol Indones 2018; 6-2: 84-88]

***Kata kunci**: konstipasi, perempuan hamil, ROME III*

Correspondence: Priska A Baidah; dr.priska@gmail.com

INTRODUCTION

Constipation is the second most common gastro-intestinal problem after vomitus that often suffered by pregnant women. Constipation during pregnancy occurs about 11% to 38%.[1-3] The existence of constipation may contribute to increase in living cost and medical treatment, decrease productivity and quality of life as well as inducing permanent ailment such as pelvic muscle dysfunction. Constipation also can delay recovery time of digestion function after delivering baby and increase the prevalence of hemorrhoid. Hormonal changes, fetal and placental development, diet and physical activity alterations are factors that can caused constipation in pregnancy.[4-9] In Indonesia there are a lot of study about constipation, however, almost all of the subjects are children and elderly, while pregnant women are still very low. The purpose of this study to know the prevalence of constipation and its association with gestational age, fiber intake and water consumption, and the level of physical activity with constipation in pregnant women.

METHODS

This cross-sectional study was performed during the period of August to October 2016 in Dr. Cipto Mangunkusumo hospital at Obstetrics and Gynecology outpatient clinic with 174 subject samples collected by consecutive sampling. This study obtained ethical clearance from Research and Development Unit Faculty of Medicine Universitas Indonesia. Each subject signed an informed consent before participation. Inclusion criteria are pregnant woman age 20-35 years old who came to outpatient clinic in Department of Obstetrics and Gynecology, Dr. Cipto Mangunkusumo Hospital, and can read and write fluently. Exclusion criterias included history of constipation because of organic disease such as colon carcinoma, IBS, severe enteritis, rectocele and abdomen operation in last 30 days, history of bowel surgery (other than appendectomy), current treatment for thyroid disease, and has a smoking habit.

The study questionairre included validated ROME III questionairre for diagnose constipation, Bristol Stool chart for assessed stool consistency, FFQ for fiber dietary intake and IPAQ for physical activity level. Other data collected by questionnaire included demographics, medication use, gestational age, amount of water intake, medical history, and smoking habits.

The diagnosis of constipation is defined by Rome III criteria, which chronic disorder form of constipation is characterized by two or more of the symptoms: straining, lumpy or hard stools, sensation of incomplete evacuation, sensation of anorectal obstruction, manual maneuvers to facilitate defecation (digital evacuation) at least 25% of defecation, and fewer than 3 defecation per week. In addition, loose stool without using laxatives should be rare, and criteria for Irritable Bowel Syndrome (IBS) must not be met. Chronic definition is given if the onset of the symptoms are present in the last 6 months and the duration of the symptoms are present at least 3 months. Because the researcher wanted to see the constipation in pregnant women according to her gestational age, then we modify the duration in the criteria into two months. Daily fiber intake recommendation for pregnant women is 25 g/day whereas sufficient water intake recommendation is at least 8 glasses per day.

Categorical data are presented in percentage. Prevalence estimates with exact 95% confidence intervals (CI) were calculated. To determine the relationship between the variable using chi-square test and Fisher with level of significance as p value < .05.

RESULTS

In this study, we found 23 (13.2%) from 174 patients were diagnosed with constipation based on ROME III criteria.

Table 1. Prevalence of Constipation on Pregnant Woman

Characteristic	n	Percentage	CI 95%
Constipation	23	13.2	8.3-18.1
Non-Constipation	151	86.8	
Total	174	100.0	

Table 2 shows that three constipation symptoms based on ROME III criteria, most are straining, incomplete evacuation, and anorectal obstruction. Only 43.5% of subjects were diagnosed constipation that complain the frequency of defecation <3x/week. The most common stool consistency on subjects with constipation based on *Bristol stool chart* was normal stool (type 4) (60.9%). Meanwhile, only 13% of subjects had hard consistency and lumpy form that is in accordance with constipation stools. From 174 subjects, we found 81.03% of subjects were less fiber consumption, <25 gram per day.

Subjects of this study consumed 18.7 gram of fiber per day in average. From constipation group, 78.3% subjects had inadequate fiber intake. For fluid/water intake level, we found that most subjects from all groups had adequate fluid intake, by consuming 8 glass of water per day minimum, with an average of 8.76 glass per day. In subjects of this study, largest level of activity found was moderate activity, found in second and third trimester.

Table 3 shows factors associated with constipation. Unexpectedly, in relation to constipation, there were no significant relationships between constipation with gestational age (OR 4.36, 95% CI 0.51-37.48 for second trimester and OR 2.04, 95% CI 0.25-16.7 for third trimester), dietary fiber intake (OR 0.82, 95% CI 0.28-2.39), water consumption (OR 1.38, 95% CI 0.56-3.41), and physical activity (OR 1.167, 95% CI 0.28-4.87).

Table 2. Characteristic of Subjects

Parameter	Constipation n=23 (13.22%)	No Constipation n=151 (86.78%)
Constipation symptoms		
Straining	17 (73.9)	4 (2.6)
Lumpy or hard stool	13 (56.5)	1 (0.7)
Incomplete evacuation	17 (73.9)	8 (5.3)
Anorectal obstruction	14 (60.9)	0 (0)
Manual maneuvers	5 (21.7)	0 (0)
less than 3x/week	10 (43.5)	14 (9.3)
Stool Consistency~Bristol Stool chart		
Type 1	3 (13.0)	5 (3.3)
Type 2	1 (4.3)	5 (3.3)
Type 3	3 (13.0)	20 (13.2)
Type 4	14 (60.9)	88 (58.3)
Type 5	2 (8.7)	19 (12.6)
Type 6	0 (0)	11 (7.3)
Type 7	0 (0)	3 (2.0)
Fiber intake		
Adequate	5 (21.7)	28 (18.5)
Inadequate	18 (78.3)	123 (81.5)
Fluid intake		
Adequate	14 (60.9)	103 (68.21)
Inadequate	9 (39.1)	48 (31.79)
Level of Physical Activity		
Highly active	3 (13.04)	27 (17.88)
Sufficiently active	13 (56.52)	70 (46.36)
Insufficiently active	7 (30.43)	54 (35.76)

Table 3. Factors Associated with Constipation

Factors	Constipation n=23	No Constipation n=151	p Value	OR (CI95%)
Gestational Age				
Trimester 1	1 (5.88)	16 (94.1)		Reference
Trimester 2	9 (21.4)	33 (78.6)	0.254[b]	4.364 (0.508-37.481)
Trimester 3	13 (11.3)	102 (88.6)	0.694[b]	2.039 (0.249-16.671)
Fiber intake				
Adequate (≥25 g/day)	5 (15.15)	28 (84.8)	0.776[b]	0.820 (0.280-2.395)
Inadequate	18 (12.7)	123 (87.2)		
Fluid intake				
Adequate (>8 glass/day)	14 (11.9)	103 (88.0)	0.485[a]	1.379 (0.558-3.409)
Inadequate	9 (15.8)	48 (84.2)		
Level of physical activity				
Highly active	3 (10.0)	27 (90.0)		Reference
Sufficiently active	13 (15.6)	70 (84.3)	1.000[b]	1.167 (0.279-4.871)
Insufficiently active	7 (11.5)	54 (88.5)	0.553[b]	1.167 (0.441-6.330)

Categorical data displated in number (percentage) a Chi-square test, b Fisher test

DISCUSSION

Constipation prevalence in this study is 13.2% (CI 95% 8.3 - 18.1). Previous study in Asia, especially in Shanghai, China by Shi et al[9] found the constipation prevalence about 13.01%. The result is quite similar to this study. Small differences were found in a study by Bradley et al and Derbyshire et al. According to the study by Bradley et al, which was conducted in *University of Iowa Hospitals and Clinics*, US, the constipation prevalences among pregnant women is 24% (CI 95%, 16-33%), 26% (CI 95% 17-38%), 16% (CI 95% 8-26%), and 24% (CI 95% 13-36%) in first trimester, second trimester, and third trimester and 3 months *post-partum*. Beside that, according to Derbyshire E et al who conducted a study in pregnant woman in England, prevalence of constipation is 28.4%.[10,11] Both of the studies used Rome II Criteria as a diagnostic foundation of constipation. This discrepancy can be caused by the variances in measurement tools, which was used to diagnose the constipation. In this study, we use the ROME III Criteria. In addition, those differences may be caused by dietetic custom of women from different ethnic. According to the study by Smith et al[12], which was conducted a study to compare dietary pattern of Asian and Caucasian, the Caucasian people tend to consume higher protein and sugar, but contain lesser amount of fiber. Hence, this can contribute to higher constipation prevalence in pregnant women.

From the level of fiber consumption, there are 81.03% of the subjects that have less level of fiber consumption with an average consumption of fiber as much as 18.97 grams/day. This is in line with the study of Sri Wahyuni, cross sectional study at Gowa district in 2013 on 66 subjects, it found that there are 54.5% of pregnant women who rarely ate vegetables and fruit (≤1x / week). This study also found 100% of the subjects have low fiber intake (adequate fiber intake: 25 grams/day), even in those who eat vegetables often also still have a low fiber intake.[13] Study of Raissa et al (2012) in panti wreda elders, the fiber intake level were 100% low. Zulaika (2011) also showed low fiber intake in adults with normal and obese status. Fiber intake level in junior high school in Rahmania's (2012) study also showed deficit fiber intake level. Similar result were also written by Badrialaily (2004) that the average fiber intake in GMSK and Kehutanan students were not different (7.8 g/kap.day). All of this showed fiber intake level in Indonesian population are still low, whether it is in pregnant women, elders, teenagers, students with nutritional knowledge, and adults with normal and obese status.[14-17]

In relation to fiber intake in this study, there was no significant relationship between fiber consumption and constipation (p=0.776). This result is concomitant with Ambarta and Fitriani.[18,19] Other studies in pregnant women that compatible with our study were Derbyshire and Anderson.[11] Althought several studies showed high fiber intake had no relation with constipation, but there were some studies with large sample size showed that there was negative correlation between fiber intake and constipation. Increasing fiber intake in constipation was still as an early management besides of doing physical activity.

In relation to fluid intake, there was no significant correlation between fluid intake and constipation (p=0.485). The result corresponded to a study conducted by Raissa[14], but it was not similar as a study conducted by Fitriani[19]. Almost of subjects had enough water intake. Constipation was found more among subjects who had mild and moderate physical activities compared to intense physical activities. However, statistycal analysis showed that there was no significant difference between physical activities and constipation (p=0.553). This corresponded to a study conducted by Derbyshire[11], but it was not similar as a study conducted by Sanjoaquin[20]. Factor causing the insignificant difference between physical activities and constipation was dependent on subjects' memories and perception on estimating how much time they spent for doing physical activities as questioned in IPAQ questionnaire.

There were some limitations in this study, such as we could not control the recall bias which there was some difficulties for subjects to do recalling about the defecation pattern in the last 2 months. In addition, they had to recall their fiber intake pattern and the physical activities. In addition, this study could fulfill the minimal sample size but the proportion of subjects between two groups was still imbalanced. This issue could affect the power or the precision of this study. This study was done at one centre where had homogenous population therefore our result may not be generalizable to other groups of women.

CONCLUSIONS AND RECOMMENDATIONS

Constipation is the gastrointestinal tract problems that are quite common in pregnancy. Our study show that the prevalence of constipation using the Rome III criteria is 13.2%. There is no significant relationship between gestational age, daily fiber intake, water consumption, and level of physical activity on the incidence of constipation in pregnancy. Further prospective multicenter studies with a larger number of the samples are required to be conducted.

REFERENCES

1. Cullen G, O'Donoghue D. Constipation and pregnancy. Best Practice & Research Clin Gastroenterol. 2007; 21(5): 807-18.
2. Tytgat GN, Heading RC, Muller-Lissner S, Kamms MA, Scholmerich J, Berstad A, et al. Contemporary understanding and management of reflux and constipation in the general population and pregnancy: a consensus. Aliment Pharmacol Ther 2003; 18: 291-301.
3. Jewell DJ, Young G. Interventions for treating constipation in pregnancy. Cochrane Database Syst Rev 2002; 2: CD001142.
4. Lederle FA. Epidemiology of constipation in elderly patients. Drug utilisation and cost-containment strategies. Drugs Aging. 1995; 6: 465-9.
5. Foxx-Orenstein AE, McNally MA, Odunsi ST. Update on constipation: One treatment does not fit all. Cleveland Clin J Med. 2008; 75(11): 813-24.
6. Johanson JF, Kralstein J. Chronic constipation: a survey of the patient perspective. Aliment Pharmacol Ther 2007; 25: 599-608.
7. Snooks SJ, Barnes PRH, Swash M. Damage to the innervations of the pelvic floor musculature in chronic constipation. Gastroenterol. 1985; 89: 977-81.
8. Spence-Jones C, Kamm MA, Henry MM. Bowel dysfunction: a pathological factor in uterovaginal prolapsed and urinary stress incontinence. BJOG. 1994; 101: 147-52.
9. Shi W, Xu X, Zhang Y, Guo S, Wang J, Wang J. Epidemiology and risk factors of functional constipation in pregnant women. 2015. PLoS ONE 10(7): e0133521.
10. Bradley CS, Kennedy CM, Turcea AM, Rao SS, Nygaard IE. Constipation in pregnancy: prevalence, symptoms, and risk factors. Obstet Gynecol. 2007; 110(6): 1351-7.
11. Derbyshire E, Davies J, Costarelli V, Dettmar P. Diet, physical inactivity and the prevalence of constipation throughout and after pregnancy. Matern Child Nutr. 2006; 2(3): 127-34.
12. Smith Z, Knight T, Sahota P, Kernohan E, Baker M. Dietary patterns in Asian and Caucasian men in Bradford: differences and implications for nutrition education. J Hum Nut Dietetics. 1993; 6(4): 323-33.
13. Sriwahyuni. Pola konsumsi buah dan sayur serta asupan zat gizi mikro dan serat pada ibu hamil di kabupaten Gowa tahun 2013. Skripsi. Fakultas Ilmu Kesehatan Masyarakat, Universitas Hasanuddin Makassar. 2013
14. Raissa T. Asupan serat dan cairan, aktivitas fisik, serta gejala konstipasi pada lanjut usia [skripsi]. Bogor: Institut Pertanian Bogor. 2012
15. Zulaika. Konsumsi serat dan *fast food* serta aktivitas fisik orang dewasa yang berstatus gizi obes dan normal [skripsi]. Bogor: Institut Pertanian Bogor. 2011
16. Rahmania R. Hubungan antar tingkat pemenuhan kebutuhan air dan asupan serat pangan dengan status hidrasi dan konstipasi siswa SMP [skripsi]. Bogor: Institut Pertanian Bogor. 2012
17. Badrialaily. Studi tentang pola konsumsi serat pada mahasiswa [skripsi]. Bogor: Institut Pertanian Bogor. 2004
18. Ambarita EM, Madanijah S, Nurdin NM. Hubungan asupan serat makanan dan air dengan pola defekasi anak sekolah dasar di Kota Bogor. J Gizi Pangan. 2014; 9(1): 7-14.
19. Fitriani I. Hubungan asupan serat dan cairan dengan kejadian konstipasi pada lanjut usia di panti sosial Sabai Nan Aluih Sicincin tahun 2010 (skripsi). Padang: Universitas Andalas; 2011.
20. Sanjoaquin MA, Appleby PN, Spencer EA, Key TJ. Nutrition and lifestyle in relation to bowel movement frequency: a cross-sectional study of 20630 men and women in EPIC - Oxford. Publ Health Nutr. 2003; 7(1): 77-83.