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The Incidence Rate and Characteristics of Clinically Diagnosed Defecatory Disorders in the Community

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Abstract

Background—Defecatory disorders (DD) are defined by clinical and objective features of impaired rectal evacuation. The epidemiology of DD in the population is unknown, partly because many constipated patients do not undergo anorectal tests. Our objectives were to estimate the incidence rate and clinical features of DD in the community.

Methods—We reviewed the medical records of all patients older than 16 years in Olmsted County, MN, who had constipation and underwent anorectal manometry from 1999 through 2008. Criteria for diagnosing DD were constipation for 6 months or longer and one of the following: (i) abnormal rectal balloon expulsion test; (ii) reduced or increased perineal descent; or (iii) two or more abnormal features with defecography or surface electromyography.

Key Results—Of 11,112 constipated patients, 516 had undergone anal manometry; 245 of these (209 women, 36 men) had a DD. The mean (\pm SD) age at diagnosis was 44 years (\pm 18) among women and 49 years (\pm 19) among men. The overall age- and sex-adjusted incidence rate per 100,000 person-years was 19.3 (95% CI, 16.8–21.8). The age-adjusted incidence per 100,000 person-years was greater ($P < .0001$) in women (31.8 [95% CI, 27.4–36.1]) than in men (6.6 [95% CI, 4.4–8.9]). Prior to the diagnosis of DD, nearly 30% of patients had irritable bowel syndrome (IBS), 48% had a psychiatric diagnosis, 18% had a history of abuse, and 21% reported urinary and/or fecal incontinence.

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Competing Interests: The authors have no competing interests.

Contributions

Jessica Noelting. Chart review, writing and editing of the manuscript

John Eaton. Study design, chart review, writing and editing of the manuscript.

Rok Seon Choung. Study design and editing manuscript.

Alan Zinsmeister. Statistical analysis and editing the manuscript.

G Richard Locke III. Study design, writing and editing of the manuscript.

Adil Bharucha. Study design, case adjudication, writing and editing of the manuscript.

Conclusions & Inferences—Among constipated patients, DD are four-fold more common in women than men and often associated with IBS and psychiatric diagnoses.

Keywords

constipation; defecation; defecography; incidence

Chronic constipation is one of the most common digestive complaints. It affects 16% of Americans and accounts for more than \$230 million annually in constipation-related U.S. health care costs (1). Studies from tertiary medical centers suggest that up to 50% of patients with chronic constipation have a defecatory disorder (DD) which results from inadequate propulsive rectal forces and/or increased resistance, functional not anatomical, to evacuation (2–5). It is important to diagnose DD because this condition is better managed with pelvic floor retraining (i.e., biofeedback therapy) than with laxatives (6–8).

A study from Olmsted County published in 1993 suggested that the age-adjusted prevalence of symptoms of functional constipation and DD in Olmsted County was 19 and 11 per 100 individuals, respectively (9). In that study, DD was diagnosed by symptoms only. However, while the history and a careful digital rectal examination may suggest a defecatory disorder, the diagnosis requires anorectal testing (10, 11). Since anorectal tests are not widely available in the community, it is conceivable that DD may not be diagnosed in constipated patients (12). Also, while there have been several trials of pelvic floor retraining with biofeedback therapy, few studies have described the clinical features of DD (13, 14). From a public health perspective, an estimate of the incidence of DD in the community may be useful for highlighting the role of anorectal testing and planning for future needs. Hence, the aims of this study were to estimate the incidence rate and clinical features of clinically diagnosed DD in a community.

METHODS

Setting

This study was approved by the Institutional Review Board at Mayo Clinic in Rochester, Minnesota.

Olmsted County is located in southeastern Minnesota, 90 miles from a major metropolitan center (Minneapolis/St. Paul). The 2010 census population was 144,248, with approximately 30% employed in the health care industry. The urban center of Rochester (2010 population, 106,769) is surrounded by rural countryside. The demographic characteristics closely resemble the US white population (15).

Residents of Olmsted County receive their medical care almost exclusively from two group practices - Mayo Clinic and Olmsted Medical Center. Mayo Clinic has maintained a common medical record system with its affiliated hospital (Mayo Clinic Hospital — Rochester) for over 100 years. All diagnoses and surgical procedures recorded during outpatient, inpatient, emergency room or nursing home visits, autopsy examinations, and death certificates are indexed, facilitating population-based studies. Annually, over 80% of the entire population is attended by one or both of these two practices, and 96% of local

residents are seen at least once during any given four-year period (15). Because Mayo Clinic is the only institution in Olmsted County that offers the specialized testing required to diagnose DD, only Mayo Clinic patients who were Olmsted County residents were considered for review in this study.

Subjects and Review of Medical Records

All Olmsted County residents aged 16 years and older who were evaluated at Mayo Clinic between January 1, 1999 and December 31, 2008 and who received one of the following Hospital Adaptation of International Classification of Diseases (HICDA) codes, i.e., pelvic floor dysfunction (in men [07849250] and women [07859123]), functional constipation (05640112), anismus (05649314) or an ICD-9 code for irritable bowel syndrome (IBS) (564.1) were identified. Of the 11,112 patients residing in Olmsted County who had one or more of these diagnoses, 516 had undergone anal manometry. After excluding 4 patients who did not consent to review of their medical records for research, 512 patients (4.6%) were considered in this study. Additional anorectal tests in these 512 patients were as follows: barium (81 patients), magnetic resonance (25 patients), or scintigraphic defecography (55 patients), assessment of pelvic floor function with surface electromyography (EMG) (282 patients), and a balloon expulsion (BE) test (454 patients).

The medical records of all 245 subjects who satisfied the diagnostic criteria for a DD as discussed below were reviewed in detail. All information (i.e., demographic features, bowel symptoms, the results of diagnostic testing, medications, and any history of conditions that have been linked to DD) (14) was abstracted in a standardized manner and recorded on data collection forms. With one exception, only associated conditions that preceded the diagnosis of DD were considered in an attempt to identify conditions that were more likely causative for DD than consequences of the condition. Colonic and pelvic surgeries that were performed after the diagnosis of DD were also recorded. Height and weight were taken from the most recent data available adjacent to the date of diagnosis. The medical and surgical conditions documented in the medical records were diagnosed largely by specialists at Mayo Clinic. A gastroenterology trainee reviewed medical records to ensure that patients had symptoms of constipation, i.e., hard stools and/or infrequent evacuation for at least 6 months.

Assessment of Anorectal Function

Anorectal testing was conducted using established diagnostic techniques described previously. Anal resting and squeeze pressures were measured with water-perfused manometry in 47 patients (16) and high resolution anorectal manometry (ARM) in 465 patients, before and after December 2007, respectively (17). The external traction necessary to facilitate rectal expulsion of a 50 mL balloon filled with water, which is significantly correlated with the time required for BE in the seated position, was assessed (16, 18, 19). Impaired rectal evacuation was diagnosed by the need for 200 grams of external traction to facilitate rectal BE.

Additional tests (i.e., defecography and/or anal surface EMG) were generally performed when the anal manometry and rectal BE tests were inconclusive or incomplete (e.g, when

latex allergy precluded assessment of rectal BE). Anal surface EMG activity at rest and during simulated evacuation was assessed with a Thought Technology Ltd (TTL) Rectal Sensor placed in the anal canal or a TTL Extension Surface Cable attached to the perianal surface via disposable electrodes (Thought Technology Ltd, Montreal, Quebec, Canada). These sensors were connected via cables to a U-Control sEMG 60Hz amplifier (Thought Technology Ltd, Montreal, Quebec, Canada). Paradoxical contraction was defined by an increase in EMG activity greater than 20% above the baseline value (11). Anorectal images were acquired at rest, during voluntary contraction, and evacuation of rectal contents with barium radiography, magnetic resonance, or scintigraphic defecography. During scintigraphic defecography, less than 72% rectal evacuation in 4 minutes was considered abnormal (20). For all techniques, perineal descent (PD) during simulated defecation of less than 1 cm or greater than 5 cm was considered abnormal.

Diagnosis of Defecatory Disorders

The diagnosis of DD was based on the clinical features and anorectal testing (5, 21). All patients had a history of constipation for >6 months, a documented clinical impression consistent with DD, and least one of the following three criteria:

1. An abnormal rectal BE test, which is very sensitive and specific for diagnosing DD (10, 11, 22).
2. Two or more of the following features: high anal resting pressure by manometry, i.e., greater than the 90th percentile value for healthy subjects (16, 17), paradoxical contraction on surface EMG during simulated defecation, or incomplete rectal evacuation during proctography. Because dyssynergia is frequently observed in healthy people, this was not used for diagnosing DD (23).
3. Reduced (<1 cm) or increased (>5 cm) perineal descent measured with proctography.

Statistical Analysis

Incidence rates (per 100,000 person-years) were calculated assuming the total Olmsted County population was at risk. Age-adjusted, sex-specific, and age- and sex-adjusted incidence rates were computed by direct adjustment to U.S. census data (U.S. White 2010), and 95% confidence intervals (CI) computed assuming a Poisson distribution. Poisson regression models were used to assess the association of incidence rates with age and sex. A potential calendar period effect was also examined in additional models based on age- and sex-specific crude rates for three separate time periods (1999–2002, 2003–2005, and 2006–2008) within the study interval. Fischer's exact test was used to evaluate the association between sex and relevant clinical variables. All results are expressed as Mean±SD.

RESULTS

Diagnosis of defecatory disorders

Between 1999 and 2008, 512 of 11,112 (4.6%) Olmsted County residents (446 women, 66 men) with constipation and who had undergone anorectal manometry were identified. This proportion increased from 3.6% between 1999 and 2002 to 5.4% between 2003 and 2005, but plateaued thereafter (i.e., 5.1% between 2006 and 2008). Of these 512 patients, 267 patients were excluded from further analysis because the anorectal manometry was indicated for a condition other than constipation (86 patients), because the anorectal tests were normal (134 patients), or because the tests were abnormal but did not satisfy the diagnostic criteria for DD (47 patients) (Figure 1). The remaining 245 patients (209 women, 36 men) had constipation and anorectal tests consistent with a defecatory disorder. The diagnosis was based on an abnormal BE test (230 patients), defecography alone (3 patients), defecography and anorectal manometry (6 patients), and defecography and surface EMG (5 patients). The mean (\pm SD) age at diagnosis was not significantly different between women (44 ± 18 years) and men (49 ± 19 years). Sixty-three of 245 patients (26%) had a body mass index (BMI) ≥ 30 kg/m², and 25 patients (10%) had a BMI ≥ 35 kg/m².

Temporal trends in the incidence of defecatory disorders and the relationship to age and gender

The overall age- and sex-adjusted (to the US white population in the year 2010) incidence rate per 100,000 person-years was 19.3 (95% CI, 16.8–21.8). The age-adjusted incidence per 100,000 person-years was greater ($P<.0001$) in women (31.8 [95% CI, 27.4–36.1]) than in men (6.6 [95% CI 4.4–8.9]). The incidence was associated with age in men ($P=.002$) and women ($P=.0001$). In women, the incidence was greatest (57 per 100,000) between the age of 20–29 years, then declined with a second peak between the age of 80–89 years (Figure 2). In men, the incidence was less than or around 10 per 100,000 person-years until the age of 80–89 years, where it increased to 30 per 100,000 person-years.

The incidence was also associated with calendar period in women ($P<.0001$) but not in men ($P=.28$) (Figure 3). In women, the overall incidence per 100,000 person-years increased from 21.0 between 1999 and 2002 to 47.4 between 2003 and 2005, but declined to 29.7 between 2006 and 2008.

Associated medical conditions

Nearly 30% of patients had IBS, 48% had a prior psychiatric diagnosis, and 18% had shared with a physician that they had a history of abuse (Table 1). Neurological diseases were uncommon. Of the conditions, only a rectocele was associated ($P=.02$) with sex, being more common in women (13%) than in men (0%). While depression and a history of abuse were more common in women, differences were not statistically significant.

Obstetric history and other pelvic floor disorders

Prior to the diagnosis of a DD, 51 (21%) of 245 patients reported urinary incontinence (32 women and 1 man), and/or fecal incontinence (21 women and 4 men). Physical examination and/or imaging studies revealed pelvic organ prolapse (i.e., rectocele, rectal prolapse,

enterocele, or cystocele) in 39 of 245 patients (16%), which affected one (25 [10%]) or more compartments (14 [6%]). Sixty-two (25%) had a hysterectomy, and 20 (12%) had undergone colonic or pelvic surgery for urinary incontinence, a cystocele, rectocele, or a colectomy. Only 2 patients had pelvic surgery after the diagnosis of DD.

One hundred thirty-one women (63%) had one or more children; 108 women (52%) had 2 or more children. The median number of children was 2 (0–8). Overall, 36% of females were nulliparous. All 5 females aged 16–19 years and 40 (78%) females aged 20–29 years were nulliparous.

Medications

At diagnosis, 168 patients (69%) were taking one or more medications that have been associated with constipation. Of these, 84 patients (34%) were taking a medication (i.e., calcium channel or adrenergic α_2 blockers, calcium supplement, tricyclic antidepressants, or opioids) that is strongly implicated to cause constipation (Table 2). Of note, only 7% were taking opioids. One hundred and one patients (41%) were taking one or more medications for managing constipation, most frequently a fiber supplement, a stool softener, or an osmotic laxative (Table 2). There were no significant differences between the proportions of men and women who were taking medications.

DISCUSSION

In this study, the age- and sex-adjusted incidence rate per 100,000 person-years for clinically diagnosed DD among adults in Olmsted County was 19.3, which is greater than the corresponding incidence rate of Crohn's disease (i.e., 5.8 between 1940 and 1993) but less than the incidence of clinically diagnosed IBS (i.e., 196 between 1991 and 1993) (24, 25). In the latter study, which was conducted during a different time period, constipation was the presenting symptom in approximately 16% of patients, which approximates to an incidence rate of 31 per 100,000 person-years. Allowing for differences in the time period and methods between the prior study in IBS and the present study, a crude comparison suggests that a substantial proportion of patients with constipation have a DD. Because the medical records of only fraction of 11,112 patients were reviewed, we cannot assess what proportion had symptom criteria for constipation. Nonetheless, only approximately 5% of patients had undergone anorectal manometry, which suggests that the observed incidence of DD in this study may be conservative.

Similar to a prior cohort (14), the incidence of DD was much more common, indeed 4-fold higher, in women than in men (32 versus 7 per 100,000). By contrast, between 1988 and 2003 the incidence of symptoms of functional constipation was only two-fold greater in women than in men in Olmsted County (26). Hence, the greater incidence in women cannot be entirely explained by a higher incidence of symptoms of functional constipation in women than in men. Why DD are more common in women than in men is unclear. In this study, the peak incidence of diagnosis of DD was in women aged 20–29 years; 78% of these women and 36% of the overall cohort were nulliparous, which does not support a predominant role for obstetric pelvic floor injury in DD. Likewise, a case-control study observed that obstetric risk factors were not associated with DD, and that hysterectomy was

associated with a borderline increased risk (odds ratio 3.9, 95% CI, 1.0–15.6) (27). At the other extreme, a DD was diagnosed in the 7th decade and thereafter in many men and women. Indeed in men, the peak incidence of diagnosis of DD was in the 9th decade. Another possible explanation is that DD result from excessive straining in children with constipation. In this study, the age of onset of constipation could not be reliably obtained from the records. In the largest cohort of patients with DD, 37% of patients reported that their symptoms dated back to childhood (14). A long-term longitudinal assessment reported that 30% of 418 children with constipation who sought medical attention had symptoms beyond the age of 16 years (28). However, by contrast to our cohort, 67% of constipated children in the latter study were boys. Thus, a population-based, case-control study with a careful review of obstetric and surgical records is necessary to determine the contribution of these risk factors to DD (29).

Temporal trends in the incidence of diagnosis of DD were statistically significant in women but not in men. Among women, the incidence of DD increased substantially in 2003–2005 compared to 1999–2002, but declined thereafter. Conceivably, this increase during 2003–2005 is at least partly explained by increased recognition of the condition and utilization of anorectal testing. Indeed, the proportion of constipated patients who underwent anorectal manometry increased from 3.8% between 1999 and 2002 to 5.8% between 2003 and 2005, but plateaued thereafter (i.e., 5.3% between 2006 and 2008).

Nearly 50% of patients had a psychiatric diagnosis, over 40% of patients had depression, and 51% were taking an antidepressant. The proportion of patients with a psychiatric diagnosis is lower than the prevalence in our tertiary practice (65%) (13) but similar to or lower than the prevalence of depression in functional constipation in other studies (30, 31). Also, 18% of patients reported a history of abuse, as documented in the clinical records, which is lower than the prevalence (i.e., 31% for physical abuse and 22% for sexual abuse) ascertained with a questionnaire in a cohort of patients with DD (14). Nearly one quarter of patients also had fecal and/or urinary incontinence, and 12% had pelvic floor surgery before the diagnosis of DD. The overlap between DD and fecal incontinence (32–34) and separately with pelvic floor pelvic organ prolapse has been described (16). The prevalence of obesity (26%) in this cohort is comparable to that in this community (personal communication, Dr. Kent Bailey, Mayo Clinic).

From a public health perspective, these findings have two major implications. First, because DD are better managed with pelvic floor biofeedback therapy rather than laxatives, they reinforce the need for anorectal testing, as emphasized in recent guidelines (35, 36). While high resolution anorectal manometry requires considerable expertise, a portable manometry device and the rectal balloon expulsion test may facilitate access to anorectal testing in the community (11, 37). Second, the high prevalence of psychological disturbances reinforces the need for managing the condition with multi-disciplinary approaches rather than with biofeedback therapy alone.

To our knowledge this is the first study to estimate the incidence rate and clinical features of clinically diagnosed DD in the community. Mayo Clinic is the primary care provider for a majority of residents in Olmsted County, reducing the potential for referral bias. The

diagnosis of DD was based on rigorous criteria and a review of the complete medical records. However, there are several limitations, in addition to those discussed above. The findings are representative of a white population but may be generalizable to other populations. Symptom assessment was based on a review of medical records rather than a systematic questionnaire. However, a priori, it seems likely that patients referred for anorectal testing had clinically significant constipation. Because only a small proportion of constipated patients in Olmsted County had anorectal testing, these findings may be conservative and underestimate the actual incidence of DD in the community. The prevalence of associated conditions, particularly obstetric pelvic floor injury and sensitive issues (e.g., abuse), may also be underestimated because detailed obstetric records were not available and a questionnaire was not administered. The association between joint hypermobility and DD was not evaluated (38).

In conclusion, the age- and sex-adjusted incidence rate of clinically diagnosed DD in a community was 19.3 per 100,000 person-years, which is approximately 3-fold greater than the prevalence of Crohn's disease in the same community. The incidence of DD was 5-fold higher in women than in men. Nearly 50% of patients had a psychiatric diagnosis, and over 40% of patients had depression. Among women, the incidence of DD increased substantially in 2003–2005 compared to 1999–2002, but declined thereafter. Taken together, these findings reinforce the recommendation to consider anorectal testing in patients with chronic constipation refractory to simple laxatives (1, 35).

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KEY POINTS

- This study evaluated the epidemiology of defecatory disorders (DD) in the population, which is currently unknown.
- The overall age and sex adjusted incidence rate of defecatory disorders (DD) in Olmsted County between 1999 and 2008 was 19.3 per 100,000 person-years (95% CI, 16.8–21.8).
- DD are relatively common in the community; the incidence of diagnosis of DD is greater than Crohn’s disease. DD are more common in women, and are frequently associated with psychiatric conditions and IBS.

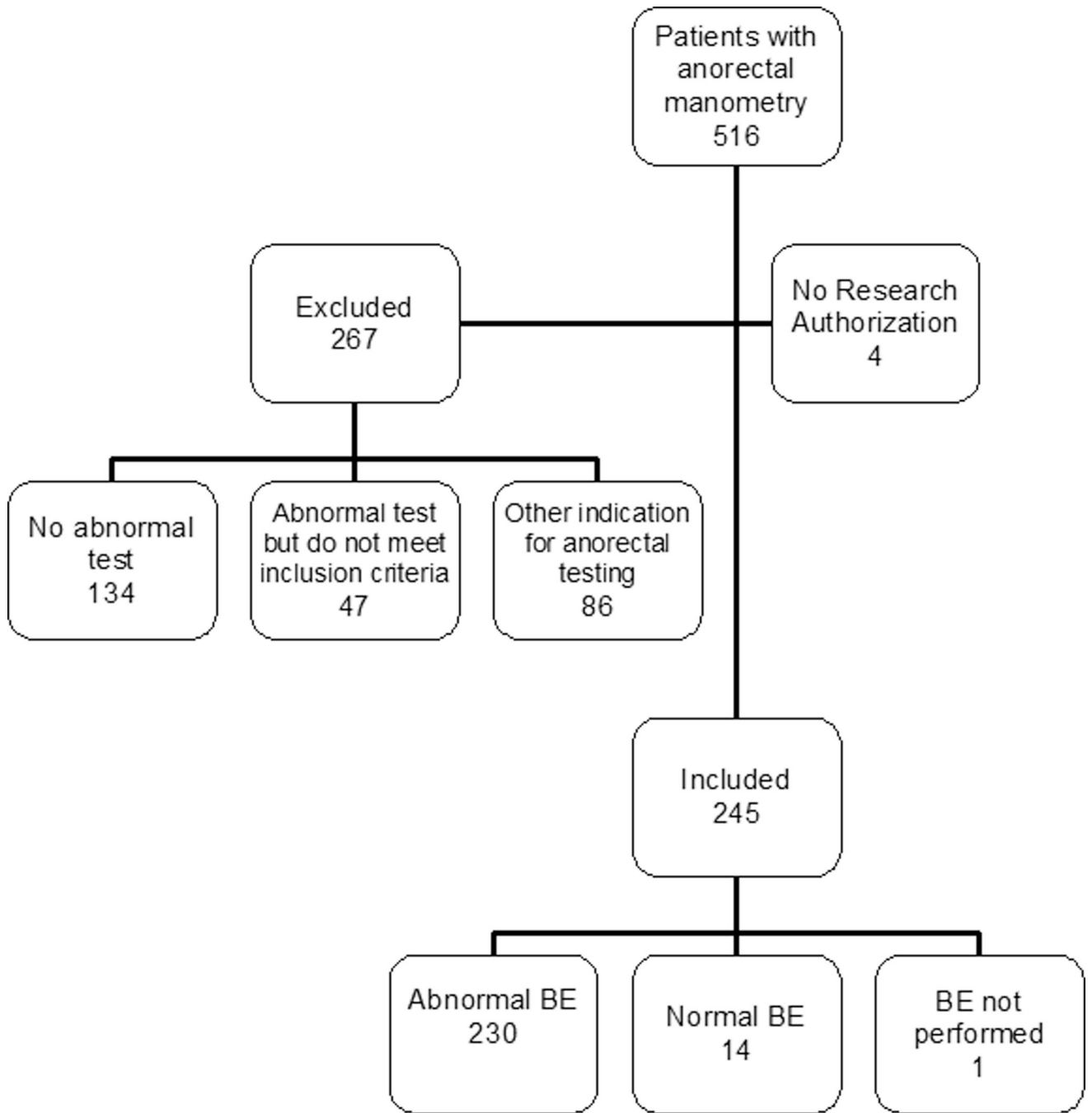


Figure 1. Study flow and results of diagnostic tests
BE - balloon expulsion

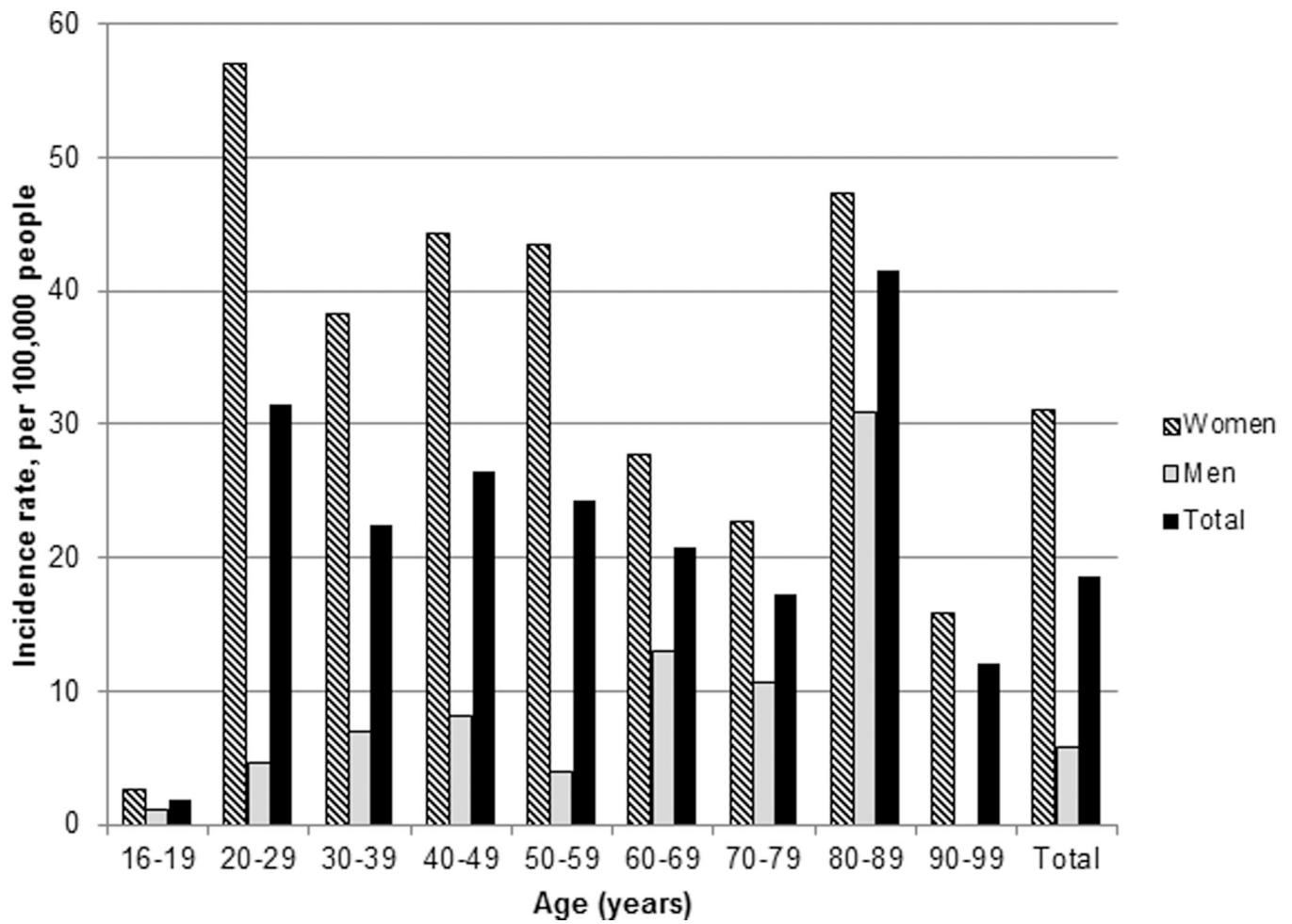


Figure 2. Distribution of the incidence rate of defecatory disorders by age and sex
 The age-adjusted incidence was greater ($P<.0001$) in women than men. The incidence was associated with age in men ($P=.002$) and women ($P=.0001$).

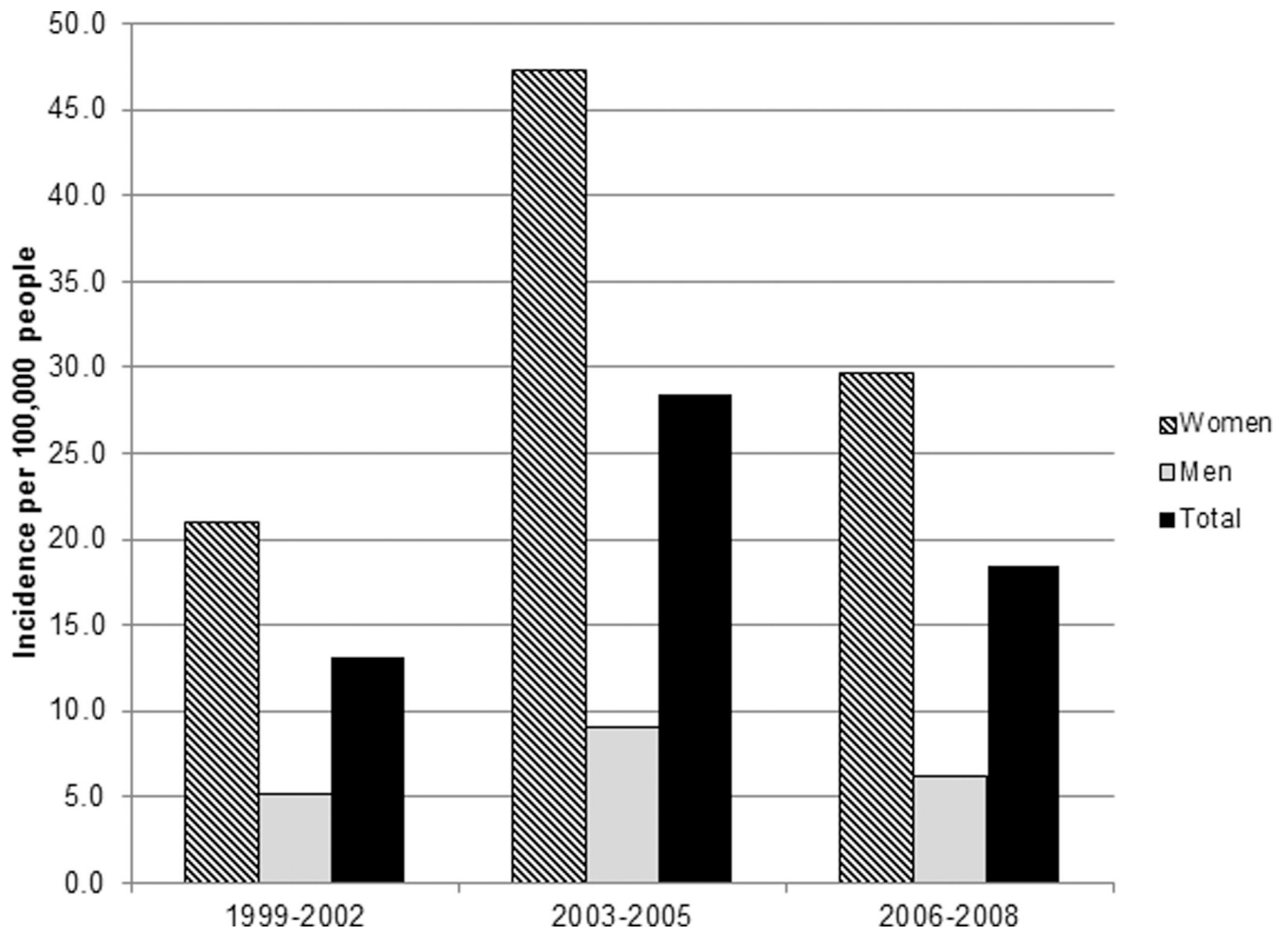


Figure 3. Temporal trends in the incidence rate of defecatory disorders

The incidence was associated with calendar period in women ($P < .0001$) but not in men ($P = .28$).

Table 1

Comparison of Clinical Features, Psychiatric Diseases, and Pelvic Surgeries in Olmsted County in Men and Women with Clinically Diagnosed Defecatory Disorders^{a, b}

	Female (209)	Male (36)	Total (245)	P-value
Age	44 ± 18	49 ± 19	44 ± 18	0.078
BMI	26.7±6.0	28.8±6.0	27.0±6.0	0.060
Other gastroenterological and pelvic floor disorders				
Irritable bowel syndrome	62 (30%)	9 (25%)	71 (29%)	0.69
Inflammatory bowel disease	1 (0.5%)	1 (3%)	2 (0.8%)	0.27
Fecal incontinence	21 (10%)	4 (11%)	25 (10%)	0.77
Rectocele	28 (13%)	0 (0%)	28 (11%)	0.019
Rectal prolapse	5 (2%)	0 (0%)	5 (2%)	1
Enterocoele	5 (2%)	0 (0%)	5 (2%)	1
Cystocele	18 (9%)	0 (0%)	18 (7%)	0.084
Urinary incontinence	32 (15%)	1 (3%)	33 (13%)	0.060
Endometriosis	13 (6%)	NA		
Polycystic ovarian disease	4 (2%)	NA		
Neurological diseases				
Parkinson's disease	0 (0%)	2 (6%)	2 (0.8%)	0.021
Multiple sclerosis	2 (1%)	0 (0%)	2 (0.8%)	1
Diabetes mellitus	7 (3%)	4 (11%)	11 (4%)	0.061
Diabetic neuropathy	2 (1%)	2 (6%)	4 (2%)	0.104
Psychiatric conditions				
Depression	97 (46%)	10 (28%)	107 (44%)	0.045
Anxiety disorder	36 (17%)	6 (17%)	42 (17%)	1
PTSD	7 (3%)	0 (0%)	7 (3%)	0.60
Eating disorder	15 (7%)	0 (0%)	15 (6%)	0.14
Any psychiatric diagnosis	103 (49%)	15 (42%)	118 (48%)	0.47
Emotional abuse	4 (2%)	0 (0%)	4 (2%)	1
Physical abuse	7 (3%)	2 (6%)	9 (4%)	0.62
Sexual abuse	8 (4%)	1 (3%)	9 (4%)	1
More than 1 type of abuse	20 (10%)	1 (3%)	21 (8%)	0.33
Any abuse	41 (20%)	4 (11%)	45 (18%)	0.35
Gastrointestinal or pelvic surgeries				
Cholecystectomy	20 (10%)	3 (8%)	23 (9%)	1
Appendectomy	35 (17%)	4 (11%)	39 (16%)	0.47
Abdominal wall hernia repair	9 (4%)	1 (3%)	10 (4%)	1
Surgery for pelvic organ prolapse	29 (14%)	1 (3%)	30 (12%)	0.093
Partial colectomy	5 (2%)	3 (8%)	8 (3%)	0.097

	Female (209)	Male (36)	Total (245)	P-value
Total colectomy	0 (0%)	1 (3%)	1 (0.4%)	0.15
Hysterectomy	62 (30%)	NA		
Abdominal	42 (20%)	NA		
Vaginal	20 (10%)	NA		

Abbreviations: Body Mass Index (BMI); Post-Traumatic Stress Disorder (PTSD).

^aVariables expressed as percentages (numbers), or means \pm standard deviations.

^bOnly conditions that preceded the diagnosis of DD were considered here.

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Table 2

Distribution of Medications in in Men and Women in Olmsted County with Clinically Diagnosed Defecatory Disorders

	Female (201)	Male (34)	Total (235)	P-value
Thyroid hormone supplement	24 (11%)	2 (6%)	26 (11%)	0.39
Antihypertensive (diuretics, ACE, adrenergic alpha or beta blockers, angiotensin receptor blockade)	29 (14%)	10 (28%)	39 (16%)	0.047
Calcium channel blockers	11 (5%)	3 (8%)	14 (6%)	0.44
Lipid lowering agents	24 (11%)	8 (22%)	32 (13%)	0.10
Antihistamine	34 (16%)	7 (19%)	41 (17%)	0.63
Calcium	48 (23%)	2 (6%)	50 (20%)	0.014
Antidepressants	107 (51%)	17 (47%)	124 (51%)	0.72
Tricyclic	16 (8%)	3 (8%)	19 (8%)	0.75
Multiple or other	16 (8%)	2 (6%)	18 (7%)	1
SSRI or SNRI	87 (42%)	14 (39%)	101 (41%)	0.86
Antipsychotic	12 (6%)	4 (11%)	16 (6%)	0.27
Non narcotic pain medications	92 (44%)	19 (53%)	111 (45%)	0.37
Opioids	15 (7%)	3 (8%)	18 (7%)	0.73
Medications for constipation				
Fiber supplement	43 (21%)	5 (14%)	48 (20%)	0.50
Osmotic laxative (sorbitol, lactulose, PEG, MOM)	30 (14%)	4 (11%)	34 (14%)	0.80
Stimulant laxative (1=Senna/sennosides)	18 (9%)	1 (3%)	19 (8%)	0.32
Lubricant laxative (mineral oil)	2 (1%)	0 (0%)	2 (0.8%)	1
Enema (1=fleet, 2=water)	3 (1%)	2 (6%)	5 (2%)	0.16
Suppository (1=glycerin, 2=dulcolax, 3=NOS)	9 (4%)	2 (6%)	11 (4%)	0.67
Stool softener (1=colace)	34 (16%)	2 (6%)	36 (15%)	0.125
Lubiprostone	1 (0.5%)	0 (0%)	1 (0.4%)	1
Tegaserod	6 (3%)	0 (0%)	6 (2%)	0.60

Abbreviations: ACE, angiotensin-converting enzyme; MOM, Milk of Magnesia; NOS, not otherwise specified; PEG, polyethylene glycol; SNRI, serotonin and norepinephrine reuptake inhibitors; SSRI, selective serotonin reuptake inhibitors;