Volume 38

Diseases of the
COLON & RECTUM

Number 4

APRIL 1995

ORIGINAL CONTRIBUTIONS

Prevalence of Benign Anorectal Disease in a Randomly Selected Population

Richard L. Nelson, M.D.,*† Herand Abcarian, M.D.,* Faith G. Davis, Ph.D.,† Victoria Persky, M.D.†

*From the *Department of Surgery, University of Illinois College of Medicine at Chicago, and the †Epidemiology and Biometry Division, University of Illinois School of Public Health, Chicago, Illinois*

BACKGROUND: The prevalence of benign anorectal diseases (BAD) in the general population has been difficult to establish, either because the individual diseases themselves were difficult to characterize in surveys or because of bias in the selection of the survey population. Reported herein is a prevalence survey of BAD symptoms and treatment history of a sample of the general population, selected by random digit dialing. METHOD: A survey instrument that inquired into symptoms of BAD, BAD treatment history, and health-seeking behaviors was administered by telephone interview with 102 individuals, between the ages of 21 and 65 of both genders and all races, chosen by random digit dialing in the Joliet, Illinois area. For selected variables (gender, education level, obesity, previous BAD treatment, fiber supplementation, time for defecation and reading during defecation all related to BAD symptoms) odds ratios and 95 percent confidence intervals were calculated. RESULTS: Of the 102 individuals, 9 had been previously treated for hemorrhoids, 4 by surgery, and 5 medically. Twenty individuals currently have BAD symptoms, six of these have multiple symptoms frequently, implying established BAD, and four of these have been previously treated for hemorrhoids. Seven of eight individuals with rectal bleeding in the past year have not sought medical evaluation. Of the associations tested, statistical significance was found only between female gender and BAD symptoms (odds ratio = 4.6; 95 percent confidence interval = 1.3 - 20.4). CONCLUSIONS: History of hemorrhoidal treatment and current BAD symptomatology are highly prevalent in a randomly selected population, and 80 percent of the subjects with symptoms of BAD have not consulted a physician regarding BAD. Some previously held correlates of hemorrhoidal symptoms, such as obesity and extended time for defecation, showed no apparent association with hemorrhoid treatment history or current BAD symptoms. The best predictors of current BAD symptoms were female gender (odds ratio = 4.6; 95 percent confidence interval = 1.3-20.4) and previous hemorrhoid treatment (odds ratio = 3.9; 95 percent confidence interval = 0.7-20). [Key words: Benign anorectal diseases; Hemorrhoids; Pruritis ani]

Nelson RL, Abcarian H, Davis FG, Persky V. Prevalence of benign anorectal disease in a randomly selected population. Dis Colon Rectum 1995;38:341-344.

The prevalence of benign anorectal diseases has been extraordinarily difficult to establish.[1] Several data sources have been used to estimate this prevalence. These include the Ambulatory Care Survey[2] and Health Interview Survey[3] of the National Center for Health Statistics, Hospital Discharge Surveys,[4] the National Disease and Therapeutic Index as well as single hospital-based surveys of hemorrhoid history or treatment history and physical examination surveys of hospitalized patients.[5, 6]

Hemorrhoids best illustrate the problem. The prevalence of hemorrhoids alone using the above data sources has varied from 1 to 86 percent. Clearly biases are entering into the system at every level for there to be such marked variation. Hemorrhoids is a "disease," wherein physical findings often do not correlate with symptom severity. Many other anorectal conditions

Supported by grants from The American Society of Colon and Rectal Surgeons Research Foundation and Konsyl Pharmaceuticals.
Address reprint requests to Dr. Nelson: Department of Surgery, University of Illinois Hospital, Room 2204 M/C 957, 1740 West Taylor Street, Chicago, Illinois 60612.

simulate hemorrhoidal symptoms,[7] and a certain degree of sophistication is required to differentiate fissure from pruritis from hemorrhoids from Crohn's disease from cancer. Patients are lacking in this sophistication (making self-reporting surveys of diagnosis often a compendium of all the above diagnoses) and, sadly, so are many physicians. In addition, factors other than symptoms alone may determine whether a patient seeks medical advice[8, 9] for what is, to a certain degree, a functional complaint. It is, therefore, not surprising that reported prevalence rates have varied widely, depending on the method of ascertainment and definition, which is also problematic.[7, 10]

The success of future analytic epidemiology of benign anorectal diseases will depend in the first instance on having a clear idea of what sort of subjects will be included in the study, of how representative they are of the population as a whole with that disease, and, if they are not, in understanding exactly what bias in selection has done to alter that representativeness. This problem is minimized in the cases of catastrophic illness such as esophageal cancer and is worst with mild or functional disorders such as benign anorectal disease. For instance when referral to the study is based on registration at a major medical center, all cases of esophageal cancer would probably be seen there and be very representative of the population as a whole with that disease, whereas most patients with hemorrhoids may never consult a physician, much less go to a university hospital for care. Those that do may be very atypical for many reasons.

We attempted in the present study to determine how representative of the population at large with benign anorectal disease (BAD) a group referred from a medical practice would be, *i.e.*, are there subjects with BAD who do not see physicians and how do they differ from those that do (an example of referral bias). In so doing we derived some very crude estimates, because the population surveyed is small, of prevalence of anal canal symptoms. This survey differs from earlier surveys in the degree of randomness by which subjects were chosen and the detailed investigation of symptoms and treatment history rather than current diagnoses or physical findings.

METHODS

Telephone interviews were conducted with 102 adults, age 21 to 65 years of both genders and all races in the Joliet, Illinois area, regarding history of treatment for fissure-in-ano, fistula-in-ano, and hemorrhoids, history of anal canal symptoms and self-medication for these diseases, bowel habits, and a crude estimate of daily dietary fiber intake. Subjects were chosen by random digit dialing in the Joliet area code. This is an established epidemiologic technique for the selection of control populations in comparative studies. The questionnaire was developed by the authors, and formatting of the questionnaire and conducting of the interviews were done by Survey Research Laboratories at the University of Illinois at Chicago. Odds ratios and 95 percent confidence intervals were computed for several dichotomous variables using chi-squared analyses.[11]

RESULTS

One hundred two interviews were conducted, and the data derived from these interviews can be seen in Tables 1, 2, and 3. Means are presented of characteristics with continuous variables such as age or time spent on the toilet for each defecation, accompanied by the range of values rather than other measures of variance because of the small sample size.

Nine individuals (9 percent) have had previous hemorrhoid treatment, four by surgery and five by medical therapy. Specific symptoms surveyed indicative of BAD included bright red rectal bleeding, anorectal pain on defecation, anal wetness, and anal itching or irritation (Tables 4 and 5). A total of 20

Table 1.
Demographics of the Survey Population

Gender	47% male, 53% female
Average age	39 (range, 21–64) years
Average weight	154 (range, 97–258) pounds
Average height	67.3 (range, 60–76) inches
Married	73% Yes, 16% never, 10% divorced or separated
Race	94% White, 4% Black, 1% Hispanic
Education	46% High school, 45% university, 7% grade school
Income	95% > $8,000, 92% > $13,000, 72% > $25,000, 36% > $40,000

Table 2.
BAD History (%)

Ever had hemorrhoid surgery	4
Ever had physician treat hemorrhoids	5 (nonsurgical)
Fissure	0
Fistula-in-ano	0
Crohn's disease	0
Colitis	3
Total colectomy and ileostomy	1

Table 3.
BAD Family History (%)

Ever had relative with hemorrhoids	39
Ever had relative with fissure-in-ano	7
Ever had relative with anal abscess or fistula	4

subjects (20 percent) have had symptoms of BAD within the past year, bleeding and pain being relatively infrequent and wetness and itching more common. Four of these individuals have been previously treated for hemorrhoids, with persistence of symptoms, none for fissure or fistula. Five individuals previously treated for hemorrhoids currently have no BAD symptoms. A statistically significant association exists between female gender and BAD symptoms (Table 5).

Only one individual of eight with bright red rectal bleeding has been treated medically or surgically for hemorrhoids, and the other seven with bleeding had not sought medical advice. Only one of these eight has taken a dietary fiber supplement. Six individuals spent at least ten minutes on the toilet for each defecation, but only one of these has anorectal symptoms. By choosing individuals with more than one and increased frequency of BAD symptoms, six individuals could be judged to be more severely symptomatic and currently to have established BAD. Four of these have been previously treated, perhaps ineffectively, for hemorrhoids, two by surgery and two medically. The other 14 subjects had infrequent symptoms.

Table 4.
BAD and Associated Symptoms (%)

Chronic or recurrent diarrhea	0
Anal pain during defecation in past year	9
Frequency, less than monthly	6
Anal itching in past year	6
History of pinworm infection	3
Bright red rectal bleeding in past year	8
Frequency, only once or twice	5
Regular laxative or stimulant use	6
Frequency, PRN	3
Commercial laxative	3
Average stool frequency	1.25/day ± 0.57
80% answered 1/day; none said < 1	
Average time on toilet	3.5 minutes
Range, 1–13 minutes	
Read during defecation	40
Strain during defecation	30
Once a month	10
Less than once a month	10

Table 5.
Statistical Correlations

Association with BAD Symptoms*	Odds Ratio	95% Confidence Intervals
Female gender	4.6	1.3–20.4
Education (≤12th grade)	0.5	0.2–1.6
Obesity†	1.0	0.2–4.0
BAD treatment history‡	3.9	0.7–20.0
Time on toilet (≥10 min)	0.8	0.0–7.9
Fiber supplement	2.3	0.5–9.9
Whole wheat bread	0.3	0.1–1.4
Reading in bathroom	1.4	0.5–4.0

* Bad symptoms include bright red rectal bleeding, pain on defecation, anal wetness, and anal irritation or itching.

† Body weight greater than 200 pounds *vs.* weight less than 200 pounds. No attempt was made to estimate body mass index in this survey.

‡ Prior surgical or medical therapy for hemorrhoids *vs.* no previous hemorrhoidal treatment by a physician.

DISCUSSION

The best control group in prevalence surveys or comparative epidemiologic studies is the general population. It is only this group that can truly answer the question "How does the disease group differ in risk factors from the general population?" However, the general population is expensive to survey and tend not to be cooperative. Biases are introduced when subsets of the general population are chosen by any means, such as volunteers. The more random the choice, that is, the less it depends on the motivation of the subject or the deliberate choice of the investigator, the better.[12] The technique used to select this interview population is one of several established techniques for selecting survey subjects and controls in case/control studies, one that is thought to minimize selection bias. The obvious biases introduced by random digit dialing are that individuals without telephones, the poor, and institutionalized will be excluded. Random digit dialing is extremely expensive.

Table 6.
Dietary Habits Related to Fiber Intake (%)

Cold breakfast cereal at least once per week	67
Fiber supplement taken	12
Bran	6
Pharmacologic supplements	6
Percent whose bread is all or mostly whole wheat?	59

A great deal of healthy lifestyle seeking behavior is seen in this population as a whole, as can be seen by the choice of breads and fiber supplements (Table 6). This included many individuals without current BAD symptoms, although we did not determine if this behavior was in response to previous BAD symptoms.

Although only one of the correlations, because of the small sample size (Table 5), is statistically significant, trends are illustrated, as well as how etiologic relationships to BAD can be investigated in surveys such as this. The best predictor of BAD symptoms seen in this survey is female gender, followed by prior hemorrhoid treatment. Little correlation can be seen between fiber consumption, time spent during defecation, or reading material in the bathroom and BAD symptoms or treatment history. Of course, it would have been most interesting if we could have physically examined these subjects and correlated physical findings with their symptom history. However, because 80 percent of patients with BAD symptoms have not consulted a physician regarding BAD, the individuals submitting to a rectal examination in a doctors office may be unrepresentative of the BAD population as a whole. Therefore, surveys of BAD risk factors or therapy should account for the potential biases in subject selection when cases are referred from physician practices.

REFERENCES

1. Johanson JF, Sonnenberg A. The prevalence of hemorrhoids and chronic constipation. Gastroenterology 1990;98:380–6.
2. McLemore T, DeLozier J. 1985 Summary of the national ambulatory medical care survey. Adv Data from Vital Health Statist. No. 128. DHHS Pub. No. (PHS) 8:7–1250. PHS, Hyattsville, MD.
3. Adams PF, Benson V. Current estimates for the national health interview survey, Vital & Health Statis. Series 1989;10, No. 176. National Center for Health Statistics. DHHS Pub. No. 9:0–1504. PHS, Washington, D. C.
4. Haupt BA. Detailed diagnoses and surgical procedures for patients discharged from short-stay hospitals. United States National Center for Health Statistics. DHHS publication No. (PHS) 1979;82:1274–1. Hyattsville, MD.
5. Haas PA, Haas GP, Schmaltz S, Fox TA. The prevalence of hemorrhoids. Dis Colon Rectum 1983;26:435–9.
6. Hyams L, Philpot J. An epidemiologic investigation of hemorrhoids. Am J Proctology 1970;21:177–93.
7. Alexander-Williams J. Causes and management of anal irritation. BMJ 1983;287:1528–9.
8. Smith RC, Greenbaum DS, Vancouver JB, *et al.* Psychological factors are associated with health care seeking rather than diagnosis in irritable bowel syndrome. Gastroenterology 1990;98:293–301.
9. Tucker DM, Sandsteas HH, Logan GM, *et al.* Dietary fiber and personality factors as determinants of stool output. Gastroenterology 1981;81:879–83.
10. Smith LE. Hemorrhoids. Gastroenterol Clin North Am 1987;16:79–83.
11. Dean AG, Dean JA, Burton AH, Dicker RC. Epi-Info Manual, Version 5. USD, Inc. Stone Mountain, GA, 1991.
12. Cole P. The evolving case-control study. J Chron Dis 1979;12:15–34.