Sudan Journal of Medical Sciences
Volume 18, Issue no. 1, DOI 10.18502/sjms.v18i1.12866
Production and Hosting by Knowledge E

Research Article

Is Prolonged Sitting a Risk Factor in Developing Hemorrhoids and Anal Fissures?

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Abstract

Background: Anal fissures and hemorrhoids are common anal conditions. They cause significant morbidity, social embarrassment, and work absenteeism. In addition, they form a significant workload on the healthcare system. Nevertheless, the etiology of these conditions is still contentious. It has been observed that hemorrhoids and anal fissures are associated with prolonged sitting. This study aims to investigate this observation.

Methods: This is a case–control study. We compared 81 patients with symptomatic and endoscopically proven hemorrhoids and/or anal fissures with 162 controls with no symptoms or endoscopic evidence of perianal disease. The study was conducted at Khartoum North Teaching Hospital (KNTH) endoscopy unit between January and December 2019. Demographic data, sitting hours per day, and endoscopic findings of patients and controls were recorded in a proforma. The cases and controls were matched for age, sex, and bowel habits. Data were analyzed and compared using the SPSS version 23.

Results: The mean sitting hours for cases was 5.99 (SD 3.4) whereas that for controls was 4.0 (SD 3.0) with a highly significant difference ($P < 0.001$). Sitting for 5 hr or more per day (exposure) was associated with an increased risk of developing hemorrhoids and/or anal fissures [odds ratio 3.68, 95% CI: 2.1–6.47].

Conclusion: The study showed that sitting down for 5 hr or more per day might increase the risk of developing hemorrhoids and/or anal fissures. This finding could help in the prevention and treatment of these diseases and the reduction of recurrences.

Keywords: hemorrhoids, anal fissure, endoscopy, prolonged sitting hours

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Received 1 August 2022
Accepted 12 August 2022
Published 31 March 2023

Production and Hosting by Knowledge E

Editor-in-Chief:
Prof. Nazik Elmalaika Obaid Seid Ahmed Husain, MD, M.Sc, MHPE, PhD.

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1. Introduction

Hemorrhoids and anal fissures are common anal conditions. They (and their treatment) cause a lot of pain and morbidity to the patient. They form a large workload on health services and entail high financial expenses for patients and health providers [1]. Nevertheless, their true incidence and prevalence are difficult to know for certain [1–3]. This is due to many reasons, such as embarrassment, fear, availability of over-the-counter medications, and nonmedical healers [2–4]. In addition, social and economic difficulties are just other reasons to mention [1].

Hemorrhoids are defined as distal displacement and venous distension of anal cushions [2, 3]. Some epidemiological studies estimate that hemorrhoids affect 39–52% of adults in the Western world [2].

Although a common condition, the etiology of hemorrhoids is still contentious. While some authorities reported a low-fiber diet and constipation as risk factors [4], others did not find an association [5]. Middle age (45–65 years old), obesity, and pregnancy are, so far, supported by good evidence [2, 6].

An anal fissure (AF) is defined as “a linear or oval shaped tear or wound in the mucosa of the anal canal starting below the dentate line extending to the anal verge” [7]. AF is also a common perianal condition [3]. The etiology is still uncertain, but most authorities believe it starts as trauma to the anoderm. Risk factors include constipation, obesity, and hypothyroidism [8].

The importance of knowing the risk factors of any disease is that this knowledge helps in the primary prevention of that disease and the prevention of its recurrence. Prolonged sitting with straining on the lavatory has been identified as a risk factor, but not sitting down at work or leisure [2, 3]. Interestingly and historically, the only perianal condition that proved to be associated with sitting down at work was pilonidal sinus, which affected jeep drivers in world-war II [9, 10].

Many patients with hemorrhoids and anal fissures give a history of prolonged sitting down at work and/or for other reasons. A review of the English literature does not show any study to verify or nullify this observation [6]. Recent literature on the subject is also lacking. This study was done to investigate this observation.

2. Materials and Methods

2.1. Study design

This case–control study was conducted at Khartoum North Teaching Hospital (KNTH), Sudan, between January and December 2019.

2.2. Sample size

The sample size for the patients and controls was calculated using Kelsey and Fleiss methods (https://www.openepi.com/SampleSize/SSCC.htm)**.** The confidence level was chosen to be 95%, the power 80%, the hypothetical proportion of patients with exposure (0.66), and the hypothetical proportion of controls with exposure (0.35). The minimum sample size was calculated to be 31 for cases and 61 for controls (Kelsey) and 30 vs 59, respectively (Fleiss). It was decided to include larger numbers to strengthen the study.

2.3. Patients and controls

We included 81 patients and 162 controls. The cases were patients who presented to the endoscopy unit with clear symptoms of hemorrhoids and/or fissures in-ano and were diagnosed to have these conditions endoscopically. Patients with anal fissures and/or hemorrhoids who had other (or secondary) causes, such as tumors and/or inflammatory bowel disease, were excluded. Females who had a history of amenorrhea were also excluded. The controls were selected from patients who had an endoscopy (sigmoidoscopy and/or colonoscopy) for gastrointestinal disorders who did not have anal fissures or hemorrhoids.

2.4. Data collection and analysis

A proforma was designed to collect information on the patients and record the findings at endoscopy. The information collected included demographic data on patients such as age, sex, occupation, and average sitting hours per day. The same data were collected from controls.

Data were analyzed using the SPSS version 23. The mean (SD) of age and hours of sitting down was calculated together with the frequency of each sex among cases

and control. A bivariate analysis was conducted and the odds ratio (OR) with a 95% confidence interval (CI) was estimated.

3. Results

Both cases and controls were matched by age (*t*-value = 0.686, *P* = 0.493) (https://mathcracker.com/t-test-for-two-means#results). The ages of both patients and controls displayed normal curves. The mean age of patients was 43.5 years (16.5), whereas the mean age of controls was 42.1 years (14.2). Over 90% of both the cases and controls were aged between 20 and 69 years with almost 50% between 30 and 49 years (Table 1). Males were slightly more than females in both the controls and patients. The male-to-female ratios for controls and patients were 1.7:1 and 1.8:1, respectively. Regarding the symptom of a change in bowel habits, there was no significant difference between patients and controls.

Table 1: The age distribution of cases and controls.

Age group (yr)	Patients no.	%	Control no.	%
10–19	3	1.9	4	4.9
20–29	27	16.7	12	14.8
30–39	50	30.9	18	22.2
40–49	37	22.8	19	23.5
50–59	20	12.3	12	14.8
60–69	17	10.5	9	11.1
70+	8	4.9	7	8.6
Total	**162**	**100%**	**81**	**100%**

The two main presenting symptoms were rectal bleeding and anal pain in 53 patients (65.4%). Thirty-three patients (40.7%) complained of constipation and seven (8.6%) had perianal discharge; however, some patients had more than one symptom.

The endoscopic diagnosis was as follows: 46 patients (56.8%) had hemorrhoids, 23 (28.4%) had anal fissures, and 12 (14.8%) had a combination. Those who had other conditions such as rectal carcinoma or polyps were excluded.

The distribution of sitting hours for both cases and controls formed normal distribution curves. The mean sitting hours for the controls was 4.0 hr (SD 3.0), median 4.0, whereas that of the cases was 5.99 hr (SD 3.4) median (5.5). Comparing the two means using a *t*-test for independent samples, the *t*-value was 3.987. The *P*-value was 0.000105. The difference was thus highly significant ($P < 0.00$).

When cases and controls were grouped according to sitting hours categories (0–2 hr/3–4 hr/5–6 hr/7–8/ hr, and 9+ hr), it was observed that the number of cases with sitting hours equal to or more than 5 hr was twice the number whose sitting time was <5 hr a day (Table 2).

Table 2: Distribution of cases and controls according to sitting hour categories.

Sitting hours	No. of patients	%	No. of controls	%
0–2	13	16	47	29
3–4	14	17.3	58	35.8
5–6	25	30.9	23	14.2
7–8	15	18.5	18	11.1
9+	14	17.3	16	9.9
Total	81	100%	162	100%

It was also observed that 5 hr is the mean of the two means of cases and controls (6 and 4 hr, respectively. We, therefore, proposed the use of 5 hr as the exposure time to calculate the odds ratio.

The odds ratio was 3.68. It was calculated by 2×2 table (Table 3). The 95% confidence interval for this odds ratio lies between 2.1 and 6.47, and the 99% confidence interval between 1.76 and 7.72 (*t*-statistics.co.uk).

Table 3: Calculation of the odds ratio.

Exposure to ≥5 hr of sitting	Cases (%)	Controls (%)
Exposed	54 (66.67%)	57 (35.18%)
Unexposed	27 (33.33%)	105 (64.82%)
Total	81 (100%)	162 (100%)
Odds ratio	**3.7**	
95% confidence interval	**2.1–6.47**	

4. Discussion

According to this study, sitting down for more than 5 hr per day may be a risk factor for developing hemorrhoids and/or anal fissures. The risk of prolonged sitting is attached to the mere sitting down whether at work, (e.g., drivers), studying, or at leisure.

Several studies have shown that the posterior commissure of the anal canal receives less blood supply than the other part of the anal canal [11–13]. This may explain why 75% of fissures occur in the posterior midline [2]. Prolonged sitting may also exaggerate this ischemia.

About hemorrhoid pathophysiology, the pathogenesis is still controversial. Our findings; however, agree with the possibilities proposed by Corman and Thompson [14, 15]. Prolonged sitting may hamper venous drainage causing distension and dilatation of the veins of the internal venous plexus of the hemorrhoids and consequently abnormal distension of the arteriovenous anastomosis within the hemorrhoidal cushions. This will eventually lead to the downward displacement and prolapse of the hemorrhoidal tissue.

The absence of hemorrhoids in animals and its high prevalence in men may be attributed to their upright posture and sitting-down habits. There is now some evidence that prolonged sitting, a unique habit of men, may be a risk factor in developing both hemorrhoids and fissures.

The importance of identifying prolonged sitting hours as a risk factor for anal fissures and symptomatic hemorrhoids comes from the ease and the socioeconomic impact of its prevention. Most of our patients (65%) are young, aged between 10 and 50 years. Anal fissure pain and hemorrhoids symptoms and complications, such as rectal bleeding, can cause a lot of disruption to their studies, work, and productivity. The treatment, which may require surgery, also adds to the prolonged morbidity and financial burden on both the patients and the health services. This risk factor (of prolonged sitting) must be discussed with the patients, and advice or counseling should be given to them regarding their occupation or way of living.

Limitations

There are limitations to our study. We tried as far as we could to eliminate confounders so that the differences between cases and controls were thus focused on the sitting hours. Some confounding factors such as pregnancy and hypothyroidism were not verified by tests but by excluding those who gave a positive history. Nevertheless, this study opens the door to further investigate the association between prolonged sitting down and perianal conditions such as anal fissures and hemorrhoids.

5. Conclusion

This study sheds light on prolonged sitting down, at work or otherwise, as a possible risk factor in the etiology of anal fissures and hemorrhoids. Sitting continuously for five or more hours a day seems to increase the risk of developing hemorrhoids and/or anal fissures. It is hoped that this information helps in the primary prevention of these common anal conditions and prevents recurrence after treatment.

Acknowledgments

The authors acknowledge the cooperation and dedication of the medical and nursing staff of the gastroenterology endoscopy unit at Khartoum North Teaching Hospital (KNTH), Sudan.

Ethical Considerations

The study was approved by the ethical committees at Khartoum North Teaching hospital (KNTH) and the Alzaiem Alazhari University (AAU). Informed consent was obtained from all individual participants included in the study (cases and controls). Informed consent was obtained from all participants of the study at endoscopy. In addition, the study does not contain identifying information about participants.

Competing Interests

The authors declare that they have no competing interests.

Availability of Data and Material

Anonymous data are available.

Funding

This study was self-funded.

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