



## Original Article

# Anal position index; can it predict pelvic organ disorders in adults?



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### ABSTRACT

**Introduction:** Anal position index is calculated with a simple formula, which is used to determine the exact position of anus in perineum. This index is currently used only in neonates and infants. Anteriorly displacement of anus is a common cause of chronic constipation. Here we assessed the association between anal position index with patients' characteristics, chronic constipation, rectum prolapse uterine prolapse, and number of delivery.

**Material and methods:** This was a cross-sectional study performed in 2018 on 63 adult admitted to colorectal surgery clinic. Anus-forchette, coccyx-forchette and coccyx-scrotum and anal-scrotum were measure by a simple meter tape. Statistical Package for the Social Sciences (SPSS for Windows, ver. 18) was used for data analysis. Independent Student's t-test, correlation coefficient and ANOVA were used.

**Results:** Sixty-three patients within age range of 22–75 years old were recruited. 48 were male (76.2%) and 15 females (23.8%). Twenty-nine (46%) had chronic constipation. The mean  $\pm$  SD of the index with confidence interval of 95% was  $0.5325 \pm 0.11861$  in males and  $0.4510 \pm 0.16803$  in females. Also the mean of the index was  $0.4616 \pm 0.14007$  in patients with chronic constipation and  $0.5570 \pm 0.11559$  in patients without constipation.

**Discussion:** Anal position index can be a prognostic factor to predict chronic constipation and pelvic floor anatomy disturbance in adults as well as pediatrics.

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## O índice de posição anal pode prever doenças de órgãos pélvicos em adultos?

### R E S U M O

#### Palavras-chave:

Índice de posição anal  
Constipação crônica  
Prolapso retal  
Adulto

**Introdução:** O índice de posição anal é calculado com uma fórmula simples, usada para determinar a posição exata do ânus no perineo. Atualmente, esse índice é usado apenas em neonatos e bebês. O deslocamento anterior do ânus é uma causa comum de constipação crônica. No presente estudo, avaliou-se a associação entre o índice de posição anal e as características dos pacientes, constipação crônica, prolapso uterino, prolapso do reto e número de partos.

**Material e Métodos:** Este estudo transversal, realizado em 2018, incluiu 63 adultos admitidos na clínica de cirurgia colorretal. As distâncias ânus-frênulo dos lábios, cóccix-frênulo, cóccix-escroto e ânus-escroto foram medidas com uma fita métrica simples. O SPSS for Windows (v. 18) foi usado para análise dos dados. O teste t de Student para variáveis independentes, o coeficiente de correlação e o teste ANOVA foram usados.

**Resultados:** Sessenta e três pacientes com idade entre 22 a 75 anos foram recrutados; 48 eram do sexo masculino (76,2%) e 15 do sexo feminino (23,8%). Destes, 29 (46%) apresentavam constipação crônica. A média  $\pm$  DP do índice, com intervalo de confiança de 95%, foi de  $0,5325 \pm 0,11861$  no sexo masculino e  $0,4510 \pm 0,16803$  no sexo feminino. Além disso, a média do índice foi de  $0,4616 \pm 0,14007$  em pacientes com constipação crônica e  $0,5570 \pm 0,11559$  em pacientes sem constipação.

**Discussão:** O índice de posição anal pode ser um fator prognóstico para prever constipação crônica e alterações da anatomia do assoalho pélvico em pacientes adultos e pediátricos.

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## Introduction

Anus position index is used to assess the exact position of anus. The formula in males is calculated with anal-scrotum distance divided in coccyx-scrotum distance and in females is anal-forchette distance divided in coccyx-forchette distance. It has been shown that anus index can be associated with different disorders like chronic constipation.<sup>1</sup>

Constipation is a common complaint among people that affects their quality of life.<sup>2</sup> Constipation is also a common disorder in pediatric patients. In 1978, Lip and Ramnowski identified a large number of patients whose cause of constipation was idiopathic; these patients had an anus in a pre-normal position.<sup>3</sup>

In 1984, Rainsar et al., For the first time, presented the Analog Positioning Index (API) as a reliable measurement method for determining the normal position of anal in pediatric patients<sup>4</sup>; So far, many studies have already been undertaken in this field to obtain information from this index, including determination of abnormal anatomical position of the anus in children, based on this index.<sup>1-5</sup> However, this index has been used to determine whether the possible cause of constipation in children is an anatomical disorder.<sup>6,7</sup> However, many studies tried to promote methods to improve the measurement technique of this index.<sup>8</sup>

Chronic constipation is commonly referred to constipation for more than three years and is divided into two major categories of motor disorders of the colon (inertia) and ODS (Obstructive Defecatory Syndrome) disorders.<sup>9-11</sup> Rome II

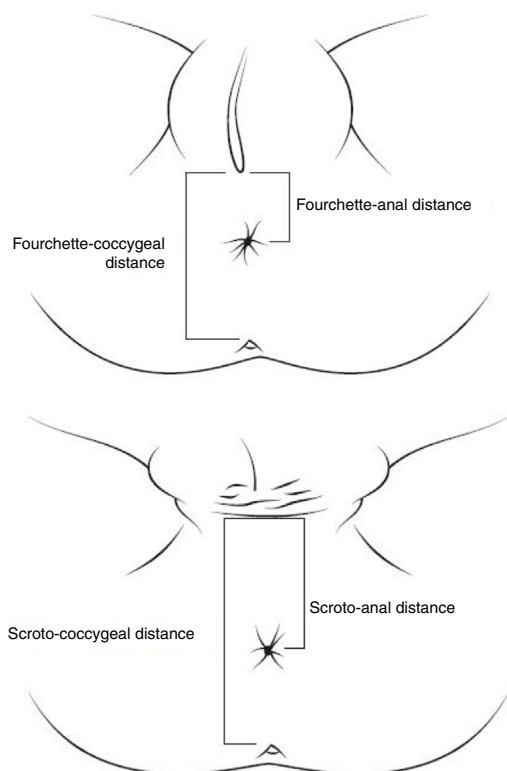
criteria is currently used for constipation diagnosis. Also, ODS is diagnosed based on Wexner score more than 14 or routine defecation by digitations or enema if score below 14 (Fig. 1).

The causes of constipation are intestinal causes and anorectal disorders.<sup>12,13</sup> Therefore, the treatment includes both medicinal and non-pharmaceutical options. Despite the fact, a half of patients complain their previous problems after receiving medical therapy. Therefore, further investigations to assess other causes of chronic constipation, such as pelvic cavity abnormalities are recommended (Table 1).

One of the main causes of constipation or fecal and urinary incontinence has been shown to be due to poor functioning of the pelvic floor. Expensive and time consuming modalities like MRI imaging has been used to assess pelvic floor anatomy.<sup>14</sup> According to the literature review, in adults, there is no index to precise the position of the anus. Very few studies have been performed to determine the position of the anus in the perineum in adults. Therefore, we tried to assess this index in adults in our study and its association with chronic constipation (Table 2).

## Methods and materials

This was a cross-sectional study performed in 2018. Sixty-three adult patients (more than 18 years old) referred to colorectal surgery clinic due to colorectal complaints were selected with convenience sampling. An informed written consent was obtained from each patient. We used simple meter tape to measure distances of anus-forchette,



**Fig. 1 – Measuring the index in males and females.**

coccyx-forchuette, coccyx-scrotum and anal-scrotum in males. Also a questionnaire including the type of constipation, rectum prolapse, and in female’s uterine prolapse and number of delivery were recorded. Mucosal prolapse of Grades 3 or 4 was considered as rectal prolapse. Wexner score and Rome II criteria were used to diagnose ODS and constipation correspondingly.

Also, due to the possible disturbance of the anatomy of the perineal area, those with a history of perineal surgery did not enter the study to reduce the chance of error in the size of index.

**Data analysis**

Statistical Package for the Social Sciences (SPSS for Windows, ver. 18) was used for data analysis. Information for

**Table 2 – Frequency of different variables associated with chronic constipation.**

Variable	Frequency	Frequency percentage
Defecatory disorder	3	10.3%
	26	89.7%
Mucosal prolapse	23	79.3%
	6	20.7%
Perineal descent	4	13.8%
Rectocele	25	86.2%
	8	27.6%
	21	72.4%
Paradoxical puborectalis	0	0%
Total	29	100%

quantitative variables was calculated as mean ± SD. For quality variables, information was reported as percentages. Independent Student’s t-test and ANOVA were used to determine the relationship between quantitative and qualitative variables. Also, correlation coefficient was used to investigate the relationship between quantitative variables. p-Value less than 0.05 was considered as statistically significant.

**Results**

The study population included 63 people, 48 males and 15 females. Individuals were between the ages of 22 and 75 years. They were divided into 5 age groups less than 30 years old, between 30 and 40 years old, between 40 and 50, between 50 and 60, and over 60 years. The mean age in all patients was 43.5 years. The mean of the index in all samples was 0.135 ± 0.513. The mean of the index in female sex was 0.4510 ± 0.16803 and in the male population was 0.5325 ± 0.11861. The duration of chronic constipation varied from 3 to 20 years, divided into two periods of less than 10 years, and 10 years and older. The duration of rectal prolapse also varied from 1 year to 7 years. The time of onset of prolapse was divided into two groups of 1 year and more than 1 year. Twenty-nine subjects had chronic constipation. The average index was 0.4616 ± 0.14700. There was a meaningfully significant difference regarding the anal position index in patients with chronic constipation and those without it (p = 0.004).

Seven patients had rectal prolapse. The mean of anal index was 0.4060 ± 0.12761. There was a meaningfully significant

**Table 1 – Demographic characteristics of the study population.**

Variable	Type of variable	Frequency	Frequency percentage
Gender	Male	48	76.2%
	Female	15	23.8%
Age	Below 30	13	20.6%
	30-40	14	22.2%
	40-50	13	20.6%
	50-60	13	20.6%
	More than 60	10	15.9%
Chronic constipation	Yes	29	46%
	No	34	54%
Total		63	

difference regarding the anal position index in patients with rectal prolapse and those without it ( $p = 0.025$ ).

## Conclusion

According to the findings of our study, the mean of the index in female sex was  $0.4510 \pm 0.16803$  and in the male population was  $0.5325 \pm 0.11861$ .

In a 1984 study in Israel, by Reissner and others, the mean of anal position index in perineal neonates was reported for the first time, in which the mean  $\pm$  SD index in male newborns was  $0.56 \pm 0.06$  and in female newborns was  $0.44 \pm 0.05$ . Also, the study was conducted in the age group of 4–18 months, with an average index of  $0.56 \pm 0.40$  in males and  $0.40 \pm 0.06$  in females.<sup>4</sup>

In a study in Taiwan in 2008, among children without constipation, 200 cases were studied, 30 of whom were between 4 and 19 months old, while others were infants. In this study, the mean of the index was  $0.54 \pm 0.03$  (95%CI) and  $0.44 \pm 0.40$  (95% CI) in female neonates. In infants aged 4–19 months, the mean of the index was  $0.53 \pm 0.02$  (95% CI) and in females was  $0.39 \pm 0.06$  (95% CI).<sup>1</sup>

Given that the population we studied was adult, a small difference in the average of the measured index is justified. Although the measured index in our study was in the normal range presented in previous studies, which could indicate independence of the index from age.

Our findings indicated a significant difference between the mean of the index in male and female sex groups. Also, in pediatric studies in 1984 by Ehnek and Tanli, there was a statistically significant difference between two sexes ( $p < 0.025$ ).<sup>8</sup>

Also, the mean of the anal score in subjects with chronic constipation was compared with those without chronic constipation. There was a statistically significant difference regarding the index between patients with chronic constipation and chronic constipation ( $p = 0.004$ ).

Anterior displacement of anus is one of the common causes of chronic constipation in infants and in younger children.<sup>15–19</sup> In a study conducted in Turkey in 2004, the anal position index less than 0.34 in females and less than 0.46 in males was considered as anterior displacement of anus. Accordingly, in our study, anterior displacement of anus was significantly higher in females than males, and the incidence of chronic constipation in both sexes was statistically significant. Also, the difference in mean of anal score in males with chronic constipation (mean index:  $0.46 \pm 0.08$ ) and without constipation (mean index:  $0.51 \pm 0.08$ ) was statistically significant, but in females this difference was not statistically significant.<sup>7</sup>

In our study, there was no significant difference in the mean of the obtained index in different age groups. In fact, increase in age does not make a significant difference in the mean of the index.

Also, in patients with rectal prolapse, the mean of the index in subjects with prolapse was  $0.4060 \pm 0.12761$  and  $0.5265 \pm 0.13104$  in healthy subjects, which had a statistically significant difference ( $p = 0.025$ ). It means that anal position index can predict rectal prolapse in adults and can be assess in further studies before and after the intervention to assess treatment success.

Likewise, there was no correlation between age and mean of the index. Also, there was no significant difference in the index between different types of constipation. However, the difference in the index was not significant in women with multiple births.

This study tried to assess the value of measuring perineal position index in adults, which has not been performed so far.<sup>14,20–23</sup> Considering the significant difference between the two groups in male and female subjects, and in subjects with constipation and healthy subjects, it can be concluded that this index can be considered as an easy, available and safe method, to measure the correct position of the anal in perineum and to predict chronic constipation and other pelvic floor disturbances. However, there is doubt whether chronic constipation has caused perineal descent and changing the anal position index or vice versa. Measuring this index in other pelvic floor disorders like pelvic organ prolapse before and after treatment might help clinicians for better treatment and management of colorectal diseases in adults. The limitations of our study could be small sample size and cross sectional design. However, more investigation with larger sample size and analytic surveys are recommended in adults to better understand the importance of such index.

## Conflicts of interest

The authors declare no conflicts of interest.

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