SPINAL STRUCTURE AND FUNCTIONS IN INDIVIDUALS WITH CHRONIC FUNCTIONAL CONSTIPATION (Open Discussion ePosters 721)

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Hypothesis / aims of study

Constipation is a common bowel disorder which is reported by 1% to 80%. It has a significant impact on quality of life and on health care costs. It is generally divided into 2 types: primary or functional constipation with functional impairment of the colon and anorectal structures and secondary constipation related to organic disease, systemic disease, or medications (1). Symptoms of functional constipation include hard, infrequent bowel movements, often accompanied by symptoms of bloating and abdominal pain.

Long-term these symptoms, incorrect defecation posture, Valsalva maneuvers, intra-abdominal pressure changes, spinal stability or core/abdominal muscles weakness may be affected spinal structure and functions (2). The changes of spinal structure and functions, including spinal posture, mobility and stability, may be negatively affected the constipation. Chase et al. reported that children with functional constipation had decreased trunk control and impaired sitting posture compared to healthy children (3). There is a need for detailed studies examining the spinal structure and functions in constipation.

Thus, the aim of this study was to investigate of spinal structure and functions in individuals with chronic functional constipation.

Study design, materials and methods

This study was designed as a case-control research. This study included 72 individuals with (Constipation group) and without (Control group) chronic functional constipation. The constipation group consisted of volunteers diagnosed with functional constipation according to Rome IV criteria between 18 to 50 years of age. In addition, they had constipation symptoms for more than 6 months. The control group included healthy volunteers between 18 to 50 years of age who had no constipation and pelvic floor dysfunctions. Neurological disease, systemic diseases, connective tissue diseases, various accompanying colonic conditions (such as intestinal obstruction, peritonitis, intestinal perforation, peptic ulcer, gastrointestinal bleeding or acute inflammation of abdominal organs), a history of abdominal radiotherapy, a history of abdominal or spine surgery, malignancy and pregnancy were excluded from the study.

Physical and clinical characteristics were questioned. Constipation severity with the Constipation Severity Scale (CSS), bowel function with a bowel diary and stool type with the Bristol Stool Scale were assessed. Spinal posture, mobility and stability parameters were evaluated for spinal structure and functions. Spinal posture and mobility in the standing position in the sagittal plane were evaluated with the Spine Mouse posture and mobility measurement device (IDIAG M360®, Fehraltorf, Switzerland) (Figure 1), and thoracic, lumbar and sacral angle and mobility values were detected. Spinal stability was assessed with trunk muscle endurance tests and Sahrmann test (Figure 2).

G*Power (Ver. 3.0.10, Franz Faul, Universität Kiel, Germany) package program was used for sample size calculation. First of all, a pilot study was conducted with 10 participants with constipation and 10 participants without constipation. The effect size was calculated according to the trunk muscle flexor scores of the pilot study. It was calculated that a total of 72 participants, with at least 36 in each group, had to be recruited to obtain 90% power with 0.80 effect size, 0.05 type I error, 0.20 type I error.

In the comparison of numerical data in the groups, the Independent Samples t-test was used. In the comparison of categorical data, the Chi-square test was used. The IBM SPSS Statistics 21.0 program was used for the analysis. ‘p<0.05’ was determined as the statistical significance level.

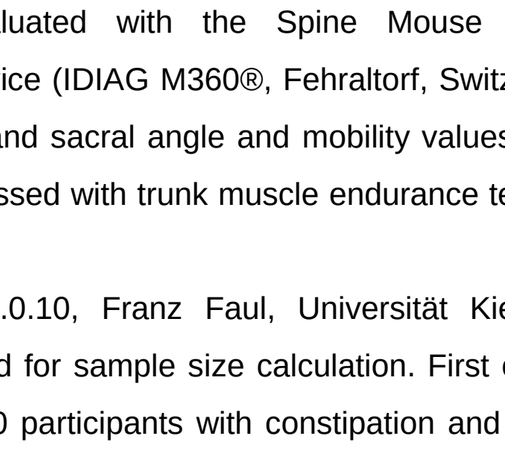

Figure 1: Spine Mouse posture and mobility measurement device

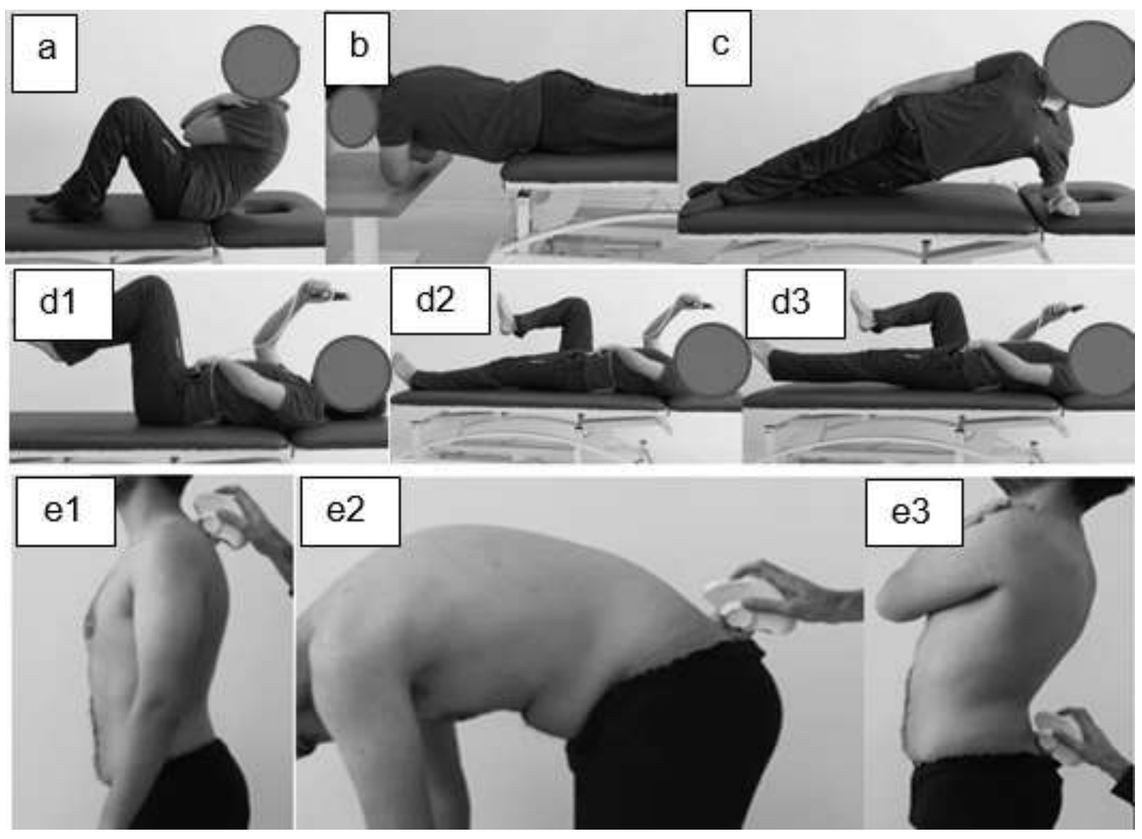

Figure 2: a. Trunk flexion muscle endurance, b. Trunk extension muscle endurance, c. Trunk lateral flexion muscle endurance, d. Sahrmann test (d1. Level 1, d2. Level 2, d3. Level 3), e. Spinal Mouse measurement (e1. Upright position, e2. Flexion position, e3. Extension position).

Results and interpretation

Physical characteristics (Constipation group: n=36, female/male=18/18, age=20.81±2.12 years, body mass index=22.30±2.59 kg/m2; Control group: n=36, famale/male=19/17, age=20.50±1.85 years, body mass index=21.31±2.63 kg/m2) of the groups were similar (p>0.05). The duration of constipation was 15.05±14.04 months, the average number of daily defecations was 1.38±0.74, and the stool consistency (according to the Bristol Stool Scale) was mostly Type 2 (86.1%) in the constipation group.

There was no difference between the sagittal thoracic, lumbar and sacral angles and mobility values of the groups (p>0.05) (Table 1). Trunk muscle flexor (p=<0.001), extensor (p=0.006), right side lateral flexor (p=0.001), left side lateral flexor muscle endurance test scores (p=<0.001) and Sahrmann test score (p=0.030) were lower in the constipation group compared to the control group (**Table 1**).

Table 1: Comparison of spinal structure and functions of the groups

Spinal Structure and Functions		Constipation Group (n=36	Control Group (n=36)	p
Spinal Posture				
Sagittal angle (X±SD)	Thoracic	37.69±9.72	36.69±10.90	0.683[a]
	Lumbar	30.81±16.83	32.03±12.56	0.728[a]
	Sacral	17.92±9.11	19.75±10.38	0.429[a]
Spinal Mobility				
Sagittal mobility (X±SD)	Thoracic	26.22±13.82	26.03±14.17	0.953[a]
	Lumbar	83.17±57.30	66.92±29.76	0.136[a]
	Sacral	32.61±15.93	23.17±35.80	0.153[a]
Spinal Stabilty				
McGill trunk muscle endurance tests (X±SD)	Trunk flexion muscle endurance score (seconds)	12.38±5.12	18.32±8.76	<0.001[a*]
	Trunk extension muscle endurance score (seconds)	16.86±7.61	23.44±11.67	0.006[a*]
	Trunk right lateral flexion muscle endurance score (seconds)	9.44±4.28	15.08±8.98	0.001[a*]
	Trunk left lateral flexion muscle endurance score (seconds)	9.99±4.03	15.53±8.47	<0.001[a*]
Sahrmann test n (%)	Level 1	33 (91.7)	24 (66.7)	0.030[b*]
	Level 2	1 (2.8)	6 (16.7)	
	Level 3	2 (5.6)	6 (16.7)	

*p<0.05, X: Mean; SD: Standard deviation; [a]Independent sample t-test; [b]Chi-square test.

In this study, spinal stability was found to be decreased in individuals with chronic functional constipation compared to those without constipation. Spinal posture and mobility of the groups did not change.

Conclusions

According to these results, it may be important to consider the assessment of spinal instability in individuals with chronic functional constipation and to recommend spinal stabilization exercises in management of these individuals.

Keywords

Anorectal/bowel dysfunction, constipation, posture, mobility, stability.

References

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