ASSESMENT OF FAECAL INCONTINENCE SCALE, QUALITY OF LIFE AND ANORECTAL MENOMETRY DATA CHANGES AFTER PERCUTANEOUS LEGGINGS NERVOUS STIMULATION IN PATIENTS WITH FAECAL INCONTINENCE

Scientific work

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SUMMARY

MARIA CLEMENTE ABENZA

ASSESSMENT OF FAECAL INCONTINENCE SCALE, QUALITY OF LIFE AND ANORECTAL MENOMETRY DATA CHANGES AFTER PERCUTANEOUS LEGGINGS NERVOUS STIMULATION IN PATIENTS WITH FAECAL INCONTINENCE

Research aim: Evaluation of fecal incontinence, quality of life and anal manometry data changes in patients with fecal incontinence after treatment PTNS.

Objectives:

- To calculate Weksner scale values changes after PTNS therapy.
- To calculate quality of life results changes after PTNS therapy.
- To compare results of anal manometry data before and after the PTNS therapy.

Methodology: The patients with faecal incontinence symptoms were treated with PTNS therapy. It was performed for 20 minutes every day during four weeks. Before and after treatment, patients were evaluated of faecal incontinence using Wexner and quality of life with QOL scales and anal manometry was performed. Additionally anal manometry test was performed for patients who became better according to Wexner score values after the treatment.

Research results: The results obtained from anal manometry after the PTNS were improved. Wexner and QOL scales show an improvement without statistical significans. Average of internal sphincter pressure at rest before and after the PTNS is 42.36±18.60 mmHg and 44.44±14.33mmHg respectively. External sphincter mean pressure measured at different levels results are: at 1cm before the PTNS therapy is 83.54±43.62mmHg and after is 78.61±38.34mmHg; at 2cm before the PTNS therapy is 68.80±41.04mmHg and after is 68.82±38.58mmHg; and at 3cm before the PTNS therapy is 61.11±33.05mmHg and after is 59.66±29.66mmHg.

Conclusions: 1. The results of Wexner scale shows improvement of faecal incontinence after the PTNS therapy only in absolute numbers. 2. The results of QoL scale shows an improvement in the quality of life of the patients. 3. The anal manometry data after PTNS therapy are better.
**SANTRAUKA**

**MARIA CLEMENTE ABENZA**

**IŠMATŲ NELAIKYMO, GYVENIMO KOKYBĖS IR ANOREKTINĖS MANOMETRIJOS DUOMENŲ POKYČIŲ VERTINIMAS PO PERKUTANINĖS BLAUZDINIO NERVO STIMULACIJOS, PACIENTAMS, SERGANTIEMS IŠMATŲ NELAIKYMU**

**Tyrimo tikslas:** įvertinti išmatų nelaikymo, gyvenimo kokybės ir analinės manometrijos pokyčius pacientams, sergantiems išmatų nelaikymu po gydymo PBNS.

**Tikslai:**
- Apskaičiuoti Weksner’io skalės pokyčius po PBNS terapijos.
- Palyginti gyvenimo kokybės pokyčius prieš ir po gydymo PBNS.
- Palyginti analinės manometrijos duomenų pokyčius prieš ir po PBNS terapijos.

**Metodologija:** pacientams, turintys išmatų nelaikymo simptomų buvo gydomi PBNS. Moduliacija atliekama po 20 minučių kasdien, keturias savaites. Prieš ir po gydymo pacientams įvertinamas išmatų nelaikymas, naudojant Wexner’io ir gyvenimo kokybė naudojant QOL skalės, atliekama analinė manometrija. Darbe tirti pacientų, stebėtų 2-4 mėnesius po PTNS, duomenys. Pacientai, kuriems išmatų laikymo funkcijos pagerėjimą rodė Wexner’io skalės balai, papildomai atliktas analinės manometrijos tyrimas.

**Tyrimo rezultatai:** Tiriamųjų pacientų analinės manometrijos rezultatai po PBNS pagerėjo.

Wexner’io skalės skirtumai. QOL skalės skirtumai. Vidaus sfinkterio spaudimas poilsio vidutiniškai prieš PBNS yra 42.36 ± 18.60 mm Hg ir po PBNS yra 44.44 ± 14.33mmHg. Išorinis sphičter slėgio reiškia matuojamas skirtinguose lygmenyse lygmenyse rezultatai yra: ne 1cm iki terapija PBNS yra 83,54 ± 43.62mmHg ir po yra 78,61 ± 38.34mmHg; 2 cm iki gydymo PBNS yra 68.80 ± 41.04mmHg ir po to, kai yra 68.82 ± 38.58mmHg; ir 3cm prieš gydymą PBNS yra 61.11 ± 33.05mmHg ir po to, kai yra 59.66 ± 29.66mmHg.

**Išvados:** 1. Wexner’io skalės įvertis po PTNS terapijos pagerėjo.ir. 2. Gyvenimo kokybės skalės rodo pagerėjimą po gydymo PBNS 3. Nustatyta teigiama analinės manometrijos rodiklių dinamika po PTNS terapijos.
ACKNOWLEDGEMENTS

Thanks to Dr. Saulius Švagždys, who was the supervisor, and help in the anal manometry procedure.
Thanks to the kinesiotherapist resident (Greta Žemaitytė), who treated the patients with the (PTNS).
Thanks to the surgery department for allowing me to meet with patients and perform the anal manometry tests.

CONFLICT OF INTEREST

The author reports no conflicts of interest.

ETHICS COMMITTEE CLEARANCE

ABBREVIATIONS LIST

PTNS – Percutaneous Tibial Nerve Stimulation
LSMU- Lietuvos Sveikatos Mosklu Universitetas
SNS – Sacral Nerve Stimulation
MA – Medical Academy
FI – Fecal incontinence
AI – Anal incontinence
QOL – Quality of life
No – Number
mA – milliampers
Hz – hertz
µs – microsecond
min – minutes
mm – millimetres
ml – millilitres
MHz – megahertz
ms – milliseconds
cm – centimetres
TENS – Transcutaneous Electrical Nerve Stimulation
SD – Standard deviation
SEM – Standard Error Mean
CI – Confidence Interval
TERMS

**Chyme**: is a semi-fluid mass of partly digested food that is expelled by the stomach, through the pyloric valve, into the duodenum.

**Circadian pattern**: A daily cycle of biological activity based on a 24 hour period and influenced by regular variations in the environment.

**Anocutaneous reflex**: Is a visible puckering at margin of the external anal sphincter, evoked by stroking the perianal skin with a pin.

**Spinal reflex arch**: Is an automatic, rapid response to a stimulus. The action is involuntary and occurs without any involvement of thought or the brain action occurs through a neural pathway signals come directly from motor neurons in the spine, instead of being delayed by going through the brain.

**Dyssynergia**: Disturbance of muscular coordination, resulting in uncoordinated and abrupt movements.

**Enemas**: injection of liquid into the rectum and colon by way of the anus.

**Kegel exercises**: Consists of repeatedly contracting and relaxing the muscles that form part of the pelvic floor. Usually kegel exercises are used for: stress incontinence, urge incontinence, pelvic floor weakness floor different reasons. These exercises are useful for both, women and men.

**Biofeedback therapy**: Biofeedback therapy is a non-drug treatment in which patients learn to control bodily processes that are normally involuntary, such as muscle tension, blood pressure, or heart rate.

**Somato-sympathetic reflexes**: is a reflex elicited by stimulation of somatic tissue and are mediated by both spinal and supraspinal circuits. The supraspinal component is mediated by circuit that includes the rostral ventrolateral medulla. When somatic stimuli occur, it produces patterns of reflex activity in segmentally distribution related with the somatic structures.
INTRODUCTION

Faecal incontinence is the involuntary passage of faecal material for at least 1 month in an individual with a developmental age for at least 4 years. The majority of the patients are elderly women. Higher incidence is found in parous women. And one-half of the patients who suffer from faecal incontinence, also suffer from urinary incontinence. [2] Faecal incontinence has a significant social and economic impact and impairs quality of life due to the loss of ability to live independently. [1]

Faecal incontinence can appear for many different causes and, in most cases, is multifactorial. Anatomical aberrations, structure damage of the perineum, nerve damage, systemic diseases, psychological causes. Nowadays all the possible causes that produce faecal incontinence are not well-known. Therefore for the diagnosis, a good history is needed as well as starting with the inspection and physical examination before, then the patient can be provided with the diagnosis required. We can divide the different kinds of studies in: laboratory tests, endoscopies, imaging studies and anorectal manometries. For the treatment, will depend if the cause/etiological factor is known or not, which may be solved treating the faecal incontinence, or if it needs to be treated apart or in combination with comorbidities. Provided that in, the patients with faecal incontinence, the treatment has to start with conservative and hygiene-dietetic measures. Then pharmacological, and if this kind of solution does not work, mini-invasive and invasive techniques have to be applied in these patients. [1, 2]

One of the treatments that is very popular is SNS (Sacral Nerve Stimulation), which started having good results with patients with urinary incontinence and, because it stimulates the same group of nerves that are involved in defecation, it started being used for faecal incontinence patients also. PTNS (Percutaneous Tibial Nerve Stimulation), was developed later on and its use is increasing. Many studies are focused on comparing if it is as good as SNS, or if it works for faecal incontinence patients. Nowadays, studies show that SNS and PTNS are having similar results in efficacy, so each time more investigations are focusing on PTNS.

It seems to be clear that PTNS is less invasive, cheaper, can be used in outpatient clinic and seems to be as effective as SNS. Despite these advantages, more studies are needed to analyze the long-term results of the technique. [22]

In this study, the changes in manometry results and Wexner and QoL scales will be compared in patients with faecal incontinence who were treated with PTNS.
AIM AND OBJECTIVES OF THE THESIS

Aim of the study

To evaluate fecal incontinence, quality of life and anal manometry data changes in patients with fecal incontinence after treatment PTNS.

Objectives of the thesis

- To calculate Weksner scale values and quality of life changes after PTNS.
- To compare evaluations of scales and anal manometry data before and after PTNS.
- To evaluate PTNS benefits for patients with faecal incontinence.
1. LITERATURE REVIEW

1.1 Faecal incontinence:

The faecal incontinence is the involuntary passage of faecal material for at least 1 month in an individual with a developmental age of at least 4 years [2]. It has a significant social and economic impact and significantly impairs quality of life [1]. It contributes to losing the ability to live independently.

Faecal Incontinence is a common symptom, with a prevalence that ranges from 7 to 15% in community-dwelling men and women, but it is often underreported, as providers seldom screen for Faecal Incontinence and patients do not volunteer the symptom, even though the symptoms can have a devastating impact on the quality of life. [3]

Some studies conclude that women are more affected than men in general. More than 1 out of 10 adult women in the population have faecal incontinence; almost 1 out of 15 have moderate to severe Faecal Incontinence [4]. The majority of patients are women and are above the age of 65 and higher incidence of incontinence is seen among parous women. Half of the patients with faecal incontinence also suffer from urinary incontinence [2].

1.2 Scoring systems for assist the severity of faecal incontinence:

There are different grading systems that are used to score the severity of faecal incontinence. The different faecal incontinence scoring systems uses are based on different variables or features. They have in common that the purpose of this scoring system is to evaluate the severity of the disease and help to guide the treatment in the best way for the patient. [5]

1.2.1 Pescatori score: A grading system of anal incontinence (AI) is described that takes into account both degree and frequency of symptoms, (table 1). A, B, and C indicate AI for flatus/mucus, liquid stool, and solid stool, respectively; 1, 2, and 3 indicate occasional, weekly, and daily AI. A scoring system, ranging from 0 (continence) to 6 (severe). [6]

Table 1. The pescatori score

(Pescatori, M, Anastasio G, Bottini C, Mentasi A.)

<table>
<thead>
<tr>
<th>A</th>
<th>Incontinence for flatus/mucus</th>
<th>Less that once a week</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>At least once a</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>week</td>
<td></td>
</tr>
<tr>
<td>Degree</td>
<td>Points</td>
<td>Frequency</td>
<td>Points</td>
</tr>
<tr>
<td>--------</td>
<td>--------</td>
<td>-----------</td>
<td>--------</td>
</tr>
<tr>
<td>A</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>A</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>A</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>B</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>B</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>
1.2.2 The Wexner score. The table is referred in this study [8], which is interpreted as Never 0; rarely < 1 month; sometimes <1/ week but >1/ month; usually <1/day and >1/week; always > 1/day. 0 is perfect and 20 total score is incontinence.

Table 2. The Wexner score.

(J. Marcio; N. Jorge; SD. Wexner)

<table>
<thead>
<tr>
<th>Type of incontinence</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Usually</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Liquid</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Gas</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Wears pad</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Lifestyle alteration</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

A study of the quality of the different scores concludes that the Wexener score seems preferable to assess severity of fecal incontinence, but only minor differences were found. [7].

1.3 Perineum anatomy:

The perineum has a diamond shape which is inferior to the pelvic floor between the thighs. The peripheral boundaries are the pelvic floor outlet, and the roof is the pelvic diaphragm (the levator ani and coccygeus muscles). The lateral walls are formed by the walls of the pelvic cavity just below the attachment of the levator ani muscle.

The perineum is divided into two triangles: anterior urogenital triangle, which contains the openings for the urinary system and the reproductive system and functions to anchor the external genitalis; and the posterior anal triangle, which contain anus and the external anal sphincter.

Major nerve: pudendal nerve (S2 to S4), and the major artery: internal pudendal artery.
The roof of the perineum: levator ani muscle (which separate the pelvic cavity from the perineum).

Anal triangle: is poster inferiorly, limited laterally by the medial margins of the sacrotuberous ligaments, anteriorly by the horizontal line between the two ischial tuberosities, and posteriorly by the coccyx. Above the anal triangle is the pelvic diaphragm (formed by the levator ani muscle). Its major muscles is: External anal sphincter. [10].

The anal sphincter complex consists of the striated pubo-rectalis muscle sling and the external anal sphincter which is divided into a deep, anorectal and a superficial, subcutaneous portion and the smooth internal anal sphincter and the longitudinal anal muscles. The latter form continuations of the circular and the longitudinal layers of the muscle coat of the rectum. Both, the longitudinal anal and the internal anal sphincters muscles course downwards to the perineal level far beyond the dentate line [ 9].

Urogenital triangle: is in the anterior part of the perineum in the horizontal plane. it contains the openings of the urogenital system. Laterally it has ischipubic rami, posteriorly the imaginary line between the ischial tuberosities, anteriorly the inferior margin of the pubic symphysis. The roof is the same as in the anal triangle, the levator ani muscle. The urogenital triangle contains a strong fibromuscular support platform, the perineal membrane and deep perineal pouch. Between the perineal membrane and the membranous layer of superficial fascia is the superficial perineal pouch, which main structures are the erectile tissues of the penis and clitoris and the associated skeletal muscles. The erectile structures join together to form the penis in men and the clitoris in women. It contains three pairs of muscles: the ischiocavernosus, bulbospongiosus, and superficial transverse perineal muscle.

The major somatic nerve of the perineum is the pudendal nerve which originates in the sacral plexus (S2-S4). It leaves the perineum through the greater sciatic foramen inferior to the piriformis muscle. Pudendal nerve has three major terminal branches: the inferior rectal, perineal nerves, and dorsal nerve of penis or clitoris.

The most relevant arteries of the perineum are: internal pudendal artery, external pudendal, the testicular, and cremasteric arteries. Internal pudendal is a branch of the internal iliac artery; it leaves the pelvis through the greater sciatic foramen inferior to piriformis muscle. Its branches are inferior rectal and perineal arteries and branches to the erectile tissues of the penis and clitoris.

In general the veins go along with the arteries and join the internal pudendal veins that connect with the internal iliac vein and the deep dorsal vein of penis or clitoris drain mainly the glans and the corpora cavernosa. [10]
1.4 Physiology of defecation:

Complex processes are involved in defecation. A sequence of events which are initiated by the entry of stool into the rectum are involved. There is a progressive rectal distension which leads to relaxation of internal sphincter. The urge to defecate increases as stool enters to the rectum from the sigmoid colon. When the defecation is desired, the anorectal angle is voluntarily straightened and the abdominal pressure is increased, this results in descent of the pelvic floor, contraction of the rectum, and inhibition of the external sphincter, and finally evacuating the rectal contents.

Defecation is determined by different factors as: defecatory position (type of toilet available, physical, mental ability, and cultural factors, in western countries using a toilet is common but in Africa or Asia squatting position is preferred (anorrectal angle becomes more obtuse with increasing in hip flexion, making evacuation easier)); age and gender is also known to affect evacuation, there are two peaks of constipation in life, in the early childhood and in the sixth decade of life and in adults, constipation is more common in women, is also proves that the colonic transit time is faster in males compared to females; other factors which can affect the evacuation of stools are: fluid intake. Access to sanitation, cultural life style, circulating hormones, and stool volume and consistency, colonic transit, rectal distensibility, anal sphincter function, anorrectal sensation, anorrectal reflexes, internal and external and sphincter status.

Phases of defecation:

1. The basal phase.
2. Pre-defecatory phase.
3. The expulsive phase.
4. Termination of defecation.

The basal phase: when the chyme goes from terminal ileum into the caecum, luminal contents are transported distally, gradual desiccation and mixing occurs, making them more solid. The transport is facilitated by complex colonic motility pattern, which is a circadian pattern that increases after awakening and higher during the day compared to night time, and also it is higher during the day after meals.

The colonic motor activity is characterized by brief (phasic) contractions and also sustained (tonic) contraction. The rectal motor contractions are seen to propagate in a retrograde direction, which help to keep the rectum empty. During the basal phase, the rectum remains mostly empty and can contain some faeces without conscious awareness.
At rest: levator ani, puborrectalis and the external anal sphincter remain in an state of continuous contractions (postural reflex), and the contraction of the puborectalis maintains the anorectal angle at 90º, angle between the long axis of the rectum and the long axis of the anal canal, angulation which helps to preserve the continence.

The anal sphincter complex is very dynamic, and is influenced by a variety of reflexes, is the intermittent transient relaxation of the internal anal sphincter (which allows descent of distal rectal contents into upper anal canal, endowing a subconscious or conscious perception.

The pre-expulsive stage: in this stage, the specific motor events happen, which culminates in the awareness by the subject's urge to defecate. The rectum is the primary place of the origin of defecatory urge. Its gradual distension produces a graded sensory response.

The expulsive stage: its efficacy may be influenced by additional voluntary straining and the appropriate posture. There is an elevation in the intrarectal pressure and relaxation of the pelvic floor and anal canal. During defecation, a variable portion of the colon, as well as the rectum, empties. To evaluate the contents, the intra-rectal pressure must exceed the canal pressure, and a necessary relaxation of the anal canal resulting in decreased anal pressure. During this stage, there is a reflex of inhibition of pelvic floor tonic activity.

Reflexes which take part into defecation:
- Rectosigmoid junction guarding reflex: there are three semilunar mucosal folds in the rectum which help to maintain its capacitance. The rectum can retain around 300ml without significant increase in intraluminal pressure. The reflex contraction of the rectosigmoid junction occurs when large volume enters the sigmoid colon.
- Anorectal inhibitory reflex: the internal anal sphincter is a circular smooth-muscle layer, innervated by the enteric nervous system. It relaxes transiently in response to rectal distension. Its role is not entirely clear, it may allow to distinguish solid, from liquid stool or gas. It does not seem be essential for the continence.
- Voluntary components: external anal sphincter and the puborectalis muscle are striated muscles with somatic innervations. The voluntary contraction of the external anal sphincter doubles the pressure in the anal canal. A spinal reflex causes the external anal sphincter contraction during the sudden increase in intrabdominal pressure (lifting or coughing).
- The puborectalis muscle is part of the pelvic diaphragm, which helps to maintain continence by forming an autonomic barrier against the discharge of stool. This angle is usually at 80-100 degrees at rest and less than 80 during the voluntary squeeze. [11, 12]
1.5 Risk factors for fecal incontinence:

Some studies show that the main risk factor for women of acquired faecal incontinence is related with childbirth in which at least one was vaginal delivery which met with complications such as perineal injury, need of forceps, perineal trauma (episiotomy, tear, ventouse extraction), and other study has demonstrated that this complications happened during the first delivery.

On the other hand, in the women who are (nulli-pari) or did not have any complication during deliveries, its potential risk factor for fecal incontinence shows that is pelvic surgery (most common hysterectomy) and in second place anal surgery.

Patients from both sexes, that goes into anal surgery (most frequent surgery haemorrhoidectomy, followed by fistula surgery and sphinterectomy for anal fissure), show similar results in complication of faecal incontinence and in the physiological dysfunction for defecation. [13]

Other studies show that most individuals become focally incontinent as a result of some form of insult as anal surgery, neurological disease, pelvis surgery or obstetric trauma. [16]

However, it is known that the symptoms may not develop for many years after the event, so the relation between cause and effect may then be unclear.

In males, the most commonly reported risk factor is anal surgery as mentioned before, other important risk factors are also pelvic surgeries as mobilization of the rectum and appendicectomy.

Other associations documented with fecal incontinence are (thoraco-lumbar spinal trauma, surgery or diabetes mellitus). [13]

Some studies show that for elder patients, the most important risk factors for both genders are urinary incontinence and polypharmacy. [14]

Older patients are twice likely to develop fecal incontinence if they already have urinary incontinence and depression, but are not well known if the incontinence of urination and fecal content raise the chance to be depressed first. [14,15]

Another study showed the relation of obese patients with the fecal incontinence, despite its age or gender, the prevalence of fecal incontinence is higher.

The results of anal squeeze pressure were significantly lower in obese patients compare to non-obese. [15]
1.6 Diagnosis of faecal incontinence:

The origin of faecal incontinence is very often multifactorial. So, local destructions, anatomical aberrations or systemic disorders must be evaluated. The evaluation of a patient with faecal incontinence involves: detailed clinical assessment plus physiological and imaging test of the anorectum. The first step for the evaluation of the patient with faecal incontinence is to confirm its existence. Clinical features recorded are: duration of symptoms, its progression, incontinence of flatus, liquid stool or solid stool, the impact on the quality of life, or the use of pads. To complete this information is very useful to record a prospective stool diary, which can show the stool habit for the patient for a week. Then detailed information has to be recorded about obstetric history, coexisting conditions as Diabetes Mellitus, neurological problems, spinal cord injury, diet, and coexisting urinary incontinence.

Physical and neurological examination has to be included (of the back and the lower limbs) in order to exclude a secondary systemic or neurological disorder. During the perineal inspection and rectal examination doctor has to be aware of: the presence of faecal matter, haemorrhoids, dermatitis, scars, the grasping of the anus, because these kinds of alterations can contribute to the anal weakness. Also, the perianal sensation has to be checked (anocutaneous reflex), which can be done by gently stroking the perianal skin with a cotton bud in each of the perianal quadrants, in which the normal response is contraction of the external anal sphincter.

During the digital rectal examination: the length of the anal canal, the acuteness of the anorectal angle, strength of the anal muscle, the presence of rectocele or impacted stools can be assessed [17]

There exist many tests that we can use to assist in the diagnosis of faecal incontinence. These tests can be divided in two main groups: imaging studies, which provide an anatomic and functional picture of the anal canal; and physiologic tests, which provide objective data regarding functional values of the anal canal.

Investigations for fecal incontinence:

Endoscopy: Can provide appropriate information of the status of mucosa of recto-sigmoid part of the colon, to exclude some disease which can affect to faecal incontinence. Mucosal inflammation, rectal masses or strictures can be seen by the colonoscopy.

- Stool studies: Is used to exclude an infection and also the volume, osmolaritie, and electrolytes can be assessed.

- Breath test: Can be used to exclude a lactose or fructose intolerance.
Anorectal manometry: provides objective data that regard to anal canal pressure, sensation and the recto anal inhibitory reflex. Is the preferred test to evaluate the weakness of the external or internal anal sphincter, and for detecting abnormal rectal sensation. Water-perfused probe with multiple space sensors is commonly used. The resting anal sphincter pressure represents the internal anal sphincter function and the voluntary squeeze anal pressure measures the external anal sphincter function. Normal squeeze pressure should measure above 120 to 180 mmHg and should sustain for 20 sec. Patients with incontinence have proven to have low resting and low squeeze sphincter pressures. The ability of external anal sphincter contractions is also assessed during abrupt increases of intrabdominal pressures such as coughing, this response is mediated by a spinal reflex arch, which can be absent in patients with spinal cord lesions above the conus medullaris, but not the voluntary squeeze.

The manometry catheter has a balloon on the end which can be used to test the sensation thresholds and the recto and inhibitory reflex. Normal sensations are more than 20 ml for initial sensations and 80-20 ml desire to defecate and 200-250ml for pain. It reduces sensations show frequently with faecal incontinence.

- Rectal balloon: It is used to measure sensory responses and the compliance of the rectal wall. The balloon is filled with water or air inside the rectum, so it is possible to assess the initial perception, the first or an urgent desire to defecate. Higher threshold for sensory perception suggest impaired rectal sensation. The rectal compliance can be calculated assessing the changes in rectal pressure during balloon distension with air or fluid.

Imaging tests for the anal canal:

- Anal endosonography: This test provides an objective assessment of sphincter integrity. With this test one can be check the thickness and structural integrity of external and internal anal sphincter. This test is performed using a rigid probe which rotates 360 degrees, creating a circular image of the anal sphincter complex. It is usually performed at 10MHz. Internal sphincter shows hypoechoigenic, whereas external sphincter (skeletal muscle), shows hyperecogenic, due to the increase of connective tissue presence. We can check from structure integrity of the both sphincters, the presence of scarring, loose of muscle tissue or other local pathologies. It has low specificity to show faecal incontinence aetiology, but it is the preferred method to evaluate the morphology of anal sphincters because is less expensive and less painful.

- Magnetic resonance: it provides superior imaging quality and better spatial resolution to demonstrate the anatomy of the sphincters, particularly for the external anal sphincter atrophy.
Defecography: it is a radiographic test which uses a fluoroscopic technique and provides functional imaging to the work-up of faecal incontinence. Around 150ml of contrast material is placed into the rectum and the patient is asked to squeeze or expel the contrast. Real-time fluoroscopic images are obtained. This test is useful in detecting rectoceles and rectal prolapses which may contribute for the incontinence symptoms.

Balloon expulsion test: This test provides information about impaired evacuation of the patient, and help to identify dyssynergia, which is a condition with a lack of coordination between the abdomen and pelvic floor. Normal subjects can expel a balloon containing 50 ml of water or silicon-filled, and most patients with faecal incontinence have little or not difficulty with evacuation.

Pudendal Nerve Terminal Latency: This test measures neuromuscular integrity between the terminal portion of the pudendal nerve and the anal sphincter. An injury in the pudendal nerve leads to denervation of the anal sphincter, so to the anal muscle weakness. The nerve damage can be a consequence of different medical disorders such as diabetes mellitus, multiple sclerosis, or it happens with pregnancy. The St.Mark’s electrode is applied to a gloved finger which is placed in the rectum on Alcock canal. Electrical stimulus is applied to the pudendal nerve in this place with the result of the contraction of the external anal sphincter, which is measured by electrodes on the palm of the St.Mark’s device, so the latency is calculated; this is the time that takes the nerve to conduct the stimulus. The normal pudendal terminal latency is 2.2 +/- 0.2ms.

Saline infusion test: this is a very simple method for the evaluation of faecal incontinence. A 2mm plastic tube is introduced 10cm aprox into the rectum. This tube is connected to an infusion pump of 1500ml of warm saline which infuse into the rectum with a rate of 60ml/min. The patient has to hold the saline as long as possible. When the patient expulses the total volume retained is recorded. Patients with faecal incontinence expulses at much lower volumes. [17, 18]

1.7 Treatment for faecal incontinence:

The treatment of faecal incontinence, start with conservative measures. When the conservative measures fail then is necessary go to the next step which is the surgical measures.

Conservative measures: its goals are to optimise the stool consistency, slow down the bowel motility and minimize the stool load in the rectum.

- A food diary can help to identify the food which aggravates the stool leakage. High fibre diet improves faecal continence by improving stool consistency.

- Also is important bowel habit and behavioural training and the use of a bowel diary.
- Supportive measures as application of barrier creams to the perianal skin, to reduce stool load, (scheduled enemas), its aim is to empty the colon from the maximum of faecal matter. It is used after dietary measures and it is used as first line medical treatment for patients with neurological diseases.

- Pharmacological therapy: different drugs are used to regularize stool frequency, to improve stool consistency or increase anal canal tone. Anti-motility drugs, as loperamide or codeine; stool-bulking agents as mucilage; ion-exchange resins as cholestyramine; some topical agents as phenylephrine can be use. Some studies show that hormone replacement therapy can be useful for post menopausal women which suffer from faecal incontinence. For the elimination of fecal impaction rectal irrigation combined with oral laxatives is used.

- Ano-rectal rehabilitation: when the initial hygiene and diet measures plus medical treatment fails, physical therapy can be used. Its goal is to re-training faecal continence enhancing both sphincters and abdominal muscles. These physiotherapy techniques involve the pelvic floor exercises, anal electrostimulation and biofeedback. For the pelvic floor are use mainly the “kegel exercises”. For the electrostimulation, surface electrodes are place on the perineum which stimulates muscular contraction. And the biofeedback therapy helps to increase the voluntary contraction of the external anal sphincter.

  Mnini-invasive approaches:

- Sacral nerve modulation: It’s usually indicated in patients who have at least one leakage at week and have failed in conservative treatment. Nowadays the mechanism of this therapeutic measure is not completely understood, some studies say that the continence is achieved via somato-sympathetic medullary reflexes. This treatment stimulates the sacral nerves on a permanent basis with an electrode which is implanted in contact with the nerve where it exists the sacral foramen. 2 steps are use in this process. First step: placement of 4 –point electrodes at the sacral root S3 linked to a temporary external stimulation device. Then if the patient shows a good response after 2-3 weeks, a definitive implantation of the pacemaker like stimulator device under skin, is perform, which is the second step.

- Tibial nerve stimulation: There are two methods of stimulation for this technique. Percutaneous and transcutaneous electrodes. Two electrodes are place on the posterior tibial nerve pathway which is linked to a stimulator that can be controlled by the patient. The posterior tibial nerve is stimulated in sessions of approximately 30 min over a minimum of 3 months. As the posterior tibial nerve originates from the ventral branches of lumbar and sacral nerves is believed that similar response can be elicited as by sacral nerve stimulation.

- Antegrade irrigation: It’s aim is to restore the continence by keeping the colon empty. A surgery is perform to create a mini-colostomy, which location can be in the umbilicus or in a cosmecologically
acceptable location, in the right lower quadrant, which allow the patient to perform colon irrigation itself.

- Injections of bulking agents: It is used to increase anal resting pressure, it bulk up the anal canal and increase the passive outlet resistance. There exist different kind of products; the most common used is “Dextranomer / hyaluronic acid”. 1 ml is injected into the deep submucosa in the proximal part of the high pressure zone of the anal canal, 5mm aprox above the dentate line. After 4 weeks, if the response is inadequate, the treatment can be repeated a second time. Expanding the anal tissue, the proximal anal canal narrows, thus preventing faecal leakage. In some studies a large number of adverse effects were reported, but most of them were not serious, other studies showed that better results appear when the injections are performed under endoanal ultrasound guidance.

- Surgical treatment:

  - Sphincter repair: It is indicated when the patient suffers from faecal incontinence associated with the external anal sphincter damage. It is recommended for patients with recent sphincter injury that it do not exceed half the circumference. The purpose is to reconstitute the circular configuration of the muscle around the anal canal, the anatomical barrier necessary for faecal continence. Short term results are generally good.

  - Dynamic sphincter replacement:
    - Implantation of artificial bowel sphincter: This approach provided a true dynamic solution for faecal incontinence. Is made of a band around the anal canal, with a pump placed in the external genital organs, and a pressure-regulated balloon. It has a lot of use limitations due to long term complications as infections, perianal pain, long term device erosion or dysfunction. So its high rate of complications combined with its moderate efficacy limits it use for the common practice.

    - Implantation of magnetic anal sphincter: Its goal is to increase the sphincter function increasing the passive outlet resistance. It is composed of a magnetic bead that creates a negative pressure around the tube it encircles. The device is made of magnetic balls together. It is designed to enhance the function of the anal sphincter without causing obstruction. In the evacuation, the patient strains in a physiological way creating sufficient force to separate the magnetic balls. Its efficacy needs to be confirmed in larger and randomized studies with longer follow-up.

    - Dynamic gracioloplasty: The autologus gracilis muscle is mobilized to replace anal sphincters. It is disconnected distally, while the proximal neurovascular bundle is preserved. A tunnel is created around the anus and the pedicled muscle is wrapped around the anal canal. Then the patient has to
learn the ability to its voluntary contraction. Then a pulse generator device is implanted for electrical stimulation of the muscle. Despite its high rate of complications as: infections, wound healing, pain, constipation, etc. This method seems to be efficient for the anal incontinence.

- Non dynamic sphincter and pelvic floor support:

  - Thierch procedure: this procedure essentially involves encircling the anal canal with implanted foreign material, and subsequently increase the passive outlet resistance because the narrowing of the anal canal and its barrier function to stool continence without altering voluntary control.

  - Non dynamic graciloplasty or gluteoplasty: It consists in the non-stimulated transposition of the gracilis muscle or the gluteous muscle and its posterior wrapping around the anal canal. It has a lot of limitations due to its complications and its lack of true functionality.

  - Pelvic floor repair: It consists in restore faecal continence correcting the supporting system of the pelvic floor and restoring the anorectal angle. Transpositions of muscles can be used, or the placement of poly-propylene meshes.

  - Colostomy: This procedure is reserved for the patients who suffer from very severe faecal incontinence or in which all the other treatments have failed. This technique can improve in their quality of life, increasing its social function, improving in depression or embarrassment, so for these kind of patients this technique granted high level of satisfaction, despite its possible complications as hernia, bleeding or mucus leakage. [19, 20]
2. RESEARCH METHODOLOGY AND METHODS

2.1. Investigated group:

For this investigation, patients with faecal incontinence, who were treated by PTNS were included into the study. There was in total 37 patients who participated. In those 37 patients PTNS was performed, as part of their treatment.

Each patient had before PTNS:
- Anal manometry.
- Record the gynaecological history.
- Wexner Scale.
- Faecal incontinence quality of life scale.

Inclusion/exclusion criteria for patients who was selected for the PTNS treatment:

Inclusion criteria:
- Faecal incontinence sufficiently severe to warrant intervention (as recommended by the principal investigator at each site).
- Failure of appropriate conservative therapies.
- Age ≥ 18 years.

Exclusion criteria:
- Inability to provide informed consent for the research study.
- Inability to fill in the detailed bowel diaries required for outcome assessments.
- Neurological diseases,
- Anatomical limitations that would prevent successful placement of needle electrode.
- Bleeding disorders
- Cardiac pacemakers
- Congenital anorectal anomalies or absence of native rectum as a result of surgery.
- A cloacal defect.
- Present evidence of external full-thickness rectal prolapse.
- Previous rectal surgery done < 12 months prior to the study (24 months for cancer).
- Stoma in situ.
- Chronic bowel diseases.
- Pregnancy or intention to become pregnant.
- Previous experience of SNS or PTNS. [21]
2.2 Methods of analysis:

The study was carried out in the LSMU, (Lietuvos Mokslų Sveikatos Universitetas), Medical Academy (MA), in KK Chirurgijos Klinika. LSMU Bioethics Commission (annex. No. 1), no BEC – MF-90 issued on 09 November 2016).

The study was carried out on June 2016 and completed on February 2016. After the PTNS treatment, we proposed to the patients to participated in further investigation. From 37 patients, 22 accepted the proposition and continue with the second part of the investigation. The research was performed from the data of those patients.

For the investigation Two questionnaires and the anal manometry test were used (annex No.2 and annex No3). Data calculated with statistical program SPSS 20. Mean differences were calculated using Student's t test for dependent samples.

2.2.1 Inquiry:

For the investigation, survey was distributed among selected patients who suffer from faecal incontinence, and the data were collected anonymously. The surveys are composed of closed questions.

For the severity of faecal incontinence it was used Wexner Scale (annex. No 2). This score takes into account five parameters, which are scored on a scale from 0(absent) to 4(daily), frequency of incontinence to gas, liquid, solid, of need to wear pad, and lifestyle changes. In this scale, 0-points mean normal function, and 20-points total incontinence.

Faecal Incontinence Quality of Life(annex No3) , which measures the index of quality of life, scales range from 1 to 4; with a 1 indicating a lower functional status of quality of life. Scales scores are the average (mean) responses to all items in the scale. Is divided into four categories: number 1: Lifestyle, ten items, Q2A Q2B Q2C Q2D Q2E Q2G Q2H Q3B Q3L Q3M; number 2: Coping/Behaviour, nine items, Q2F Q2I Q2J Q2K Q2M Q3C Q3H Q3J Q3N; number 3: Depression/Self Perception, seven items., Q1 Q3D Q3F Q3G Q3I Q3K Q4; number 4: Embarrassment, three items, Q2L Q3A Q3E. The higher the scored obtained, better is the quality of life of the patient.

2.2.2 Test and treatment procedure:

From the patients that have been treated in the surgery clinic of kauno klinikos Ligonine, 37 were selected to be treated with PTNS. Before the treatment, the wexner scale and the faecal incontinence quality of life questionnaires were fill by the patients.
Also, before the treatment, anal manometry was performed to each patient, and the data was recorded. For the anal manometry a probe which has holes through which water flows, is connected to a machine which is able to measuring the strength of the anal sphincters, is introduced through the anus, and it is capable of measuring these pressures at different levels of the anal canal.

Then, the PTNS treatment was performed to these patients.

A PTNS is a minimally invasive procedure, which consist of insertion of an acupuncture needle above the medial malleolus (inner aspect of the leg). The goal is to send stimulation through the tibial nerve, so it is important to have the needle near, no on the tibial nerve. An adjustable low voltage electrical impulse (10mA, 1-10 Hz frequency), travels via the posterior tibial nerve to the sacral nerve plexus to alter pelvic floor function by neuromodulation. The needle electrode is connected to an external pulse generator (200µs which delivers the adjustable electrical pulse. The stimulation last 20 minutes, and is carried out in 4 weeks in a daily basis. After the four weeks of treatment if there is absence of impact, the treatment is discontinued.

After the treatment the same questionnaires as before are filled by each patient, and the data is collected.

When the study started, the patients fill once more the Wexner scale and the faecal incontinence quality of life inquiry, and the anal manometry was performed.
3. Results

3.1 General data:

Of the total number of the 37 patients, who were treated with PTNS, 15 patients did not assist to the hospital for the second part of the investigations so this part of data was not included in our research. The total amount of patients who participate in the second part of the study was 22.

Patients who were treated with PTNS are shown in the Figure 1, and the patients who were included in the second part of the study.

![Fig. 1 Patients, treated by PTNS](image)

- The average age of the patients who participated in the study is 60.55±12.835. The age of the whole patients ranges between 24-84 years.
3.2 Inquiry results:

- In the evaluation of the results of the Wexner questionnaire, it is observed that the patients after PTNS treatment are better than before, but these results are not statistically significant. The average punctuation before the PTNS is 10.77±4.94 with SEM 1.05 and the average recorded after the treatment is 10.04±5.96 with SEM 1.27 p=0.441. (Fig 2)

Fig. 2. Wexner results averages before and after the PTNS therapy

- In the evaluation of the results of Faecal Incontinence Quality of Life scale, it can be seen that there is an improvement which is not statistically significant. The average before the PTNS treatment is 51.61±17.26 with SEM 1.05 and the average after the treatment the average is 54.33±22.20 with SEM 1.27. p= 0.593. (Fig 3)

Fig. 3. Faecal Incontinence Quality of Life mean before and after the PTNS therapy
The results of the four parts of the faecal incontinence quality of life inquiry are shown separately, which are: lifestyle, copying / behavior, depression / self perception, and embarrassment. Four different charts will show the results:

1. For the *lifestyle* part: before the PTNS therapy there was an average of 18.27±7.07 with SEM 1.50 and after the PTNS there was a average of 19.77±9.58 with SEM 2.04 p = 0.531. (Fig 4)

![Fig 4. Lifestyle part of incontinence score mean before and after the PTNS therapy](image)

2. For the *copying/behaviour* part: before the PTNS therapy there was an average of 14.63±5.61 with SEM 1.19 and after the PTNS there was an average of 14.63±5.53 with SEM 1.17 p = 1.000. (Fig 5).

![Fig. 5 Copying/behavior part of incontinence score mean before and after the PTNS therapy](image)
3. For the *depression/self perception* part: before the PTNS therapy there was an average of 13.23±4.75 with SEM 1.03 and after the PTNS there was an average of 13.80±5.88 with SEM 1.28 p=0.598. (Fig 6)

![Fig. 6 Depression/self perception part of incontinence score mean before and after the PTNS therapy](image)

4. For the *embarrassment* part: before the PTNS therapy there was an average of 5.68±1.88 with SEM 0.402 and after the PTNS there was an average of 5.59±3.00 with SEM 0.640 p=0.902. (Fig 7)

![Fig. 7 Embarrassment part perception part of incontinence score mean before and after the PTNS therapy](image)
3.3. Anal manometry results

During the procedure of the anal manometry, internal sphincter pressure and external sphincter pressure at 1cm, 2cm, and 3cm was recorded before and after the PTNS therapy.

**Internal sphincter pressure:** from the manometry, results were recorded, which were performed to the patients before and after the PTNS therapy. The normal amount of pressure for a healthy person is between 40 and 80mmHg. In the evolution an improvement in the results of internal sphincter tone are noted in rest, which are not statistically significant. The average of results of internal sphincter tone in rest before the PTNS therapy is 40.94±15.05 mmHg with SEM 3.54 and after the PTNS therapy is 44.44±14.33 mmHg with SEM 3.37 \( p = 0.001 \). (Fig 8)

![Fig. 8 Internal sphincter pressure mean before and after the PTNS therapy](image)

**External sphincter pressure** was also recorded from the manometry results, before and after the PTNS therapy. This pressure was recorded at different levels, at 1 cm, 2cm and 3cm of distance. Normal pressure in the external sphincter is from 100 to 180mmHg. In the evolution is noted an improvement in the results of external sphincter pressure in rest which are not statistically significant.

1. The average of the results at 1 cm before the PTNS therapy is 75.44±40.77 mmHg with SEM 9.61 and after the PTNS therapy is 78.61±38.34 mmHg with SEM 9.03 \( p = 0.030 \) (Fig. 9)

![Fig. 9 External sphincter pressure at 1 cm mean before and after of PTNS therapy.](image)
2. The average of the results at 2cm before the PTNS therapy is 64.70±41.40 with SEM 10.04 and after the PTNS therapy 68.82±38.58 with SEM 9.35, p=0.011 (Fig. 10)

3. The average of the results at 3cm before the PTNS therapy is 56.66±32.44 with SEM 8.37 and after the PTNS therapy 59.66±29.66 with SEM 7.66, p=0.070. (Fig. 11)
4. DISCUSSION

A deep research about PTNS therapy was done. This therapy is relatively new for faecal incontinence disorder. Firstly, it was used for urinary incontinence and then it was started to use for faecal incontinence, so nowadays, there are not studies for long-term outcomes and its results[23].

PTNS therapy, has its origins in trans-cutaneous nerve stimulation (TENS), described by Melzack and Wall in 1965, who developed a report in which they used neurostimulation for analgesia purposes. TENS refers to the delivery of electrical currents through the skin, to activate the peripheral nerves. They created the “Gate control theory of pain”, which suggest that psychological factors play a role in the perception of pain [24,25].

Then, TENS was used for urinary incontinence. The optimal stimulation parameters in bladder dysfunction remain unclear, but a beneficial effects were evident in some studies of detrusor overactivity. Despite the benefits in some short-term studies, there is no clear benefits in long-term studies and there were differences in the way of performing it [26,27].

TENS therapy lead to development of Sacral Nerve Stimulation therapy, which applies a low-voltage electrical current to the sacral nerve roots, which stimulate multiple afferent sensory pathways in the spinal cord. First, it was used for urinary incontinence and then for faecal incontinence [23]. Different studies report benefits and positive results for faecal incontinence with the use of SNS. A study about the outcomes of SNS for faecal incontinence showed a significant improvement of faecal incontinence scores and quality of life, the study was carried out in Northern Ireland and was from 2006 to 2012, pre and post operative assessment of severity of incontinence and quality of life scale was performed using Cleveland Clinic incontinence score. In the results it can be seen an improvement in physical role, general health, social functioning, emotional role, and in mental health [28].

Despite these good results, the SNS is an invasive technique, which needs anaesthesia for the implantation of the generator and is a very expensive technique.

After SNS, PTNS was developed, which is an easier way to access to stimulate the same sacral nerves but in a less invasive way and it is cheaper. The tibial nerve is composed of sensors, motor and autonomic fibres which arise from L4-L5 and S1-S3 [23].

First, PTNS therapy was used for urinary incontinence, and in the literature review it showed a positive evolution in patients in which were refractory for conservative treatment.

Then, because it stimulates the same part of pelvic muscles as SNS it was used for faecal incontinence.
In the literature review, we can see that there were good results in this field with these kind of patients, but because is still a new technique used in this field, it is necessary to continue making researches for long time follow up.

We can see these results in different studies.

In a prospective cohort study in 2004 there were 150 patients studied from 2008 to 2012 who were treated with PTNS therapy, in which the baseline Cleveland Clinic Florida – FI score ± SD (12.0±3.9) improved after 12 PTNS sessions (9.4±4.6). It was a well tolerated treatment with a very high acceptability, and the purpose was that PTNS therapy has to be considered as first step for FI in patients which are refractory to conservative therapies [29].

Another study, carried out in the Royal London Hospital in 2010, they follow up 31 patients with FI for an average of 9 months, which were treated with PTNS in which the Cleveland Clinic incontinence scores declined from 13 to 7, and they conclude that the patients were improving, particularly in urge faecal incontinence [30].

Nowadays the researches also focus in compare SNS and PTNS therapy to check if it has the same efficacy in FI treatment.

The short-term follow up studies have shown good results, or concluded that very similar results are achieved by both techniques and focusing in the PTNS advantages [31,32], but there is a need for more studies of long term outcomes for this therapy used in FI patients.

We found not only the tendention in improvement of Wexner and quality of life scale benefit. It could mean that bigger numbers of patient are needed to get a statisticaly significant results.
5. CONCLUSIONS

1. The results of Wexner scale shows improvement of faecal incontinence after the PTNS therapy.
2. The results of QoL scale shows an improvement in the quality of life of the patients.
3. The anal manometry data after PTNS therapy are better.
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DĖL PRITARIMO TYRIMUI

LSMU Bioetikos centras, įvertinęs (MA) vientisųjų studijų programos – MEDICINA
V k. stud. María Clemente Abenza (mokslinio darbo vadovas: lekt. Saulius Švagaždys, LSMUL
KK Chirurgijos klinika) mokslinio-tiriiamojo darbo temas: „Assessment of anorectal manometry
changes after PTNS, for patients with fecal incontinence“ tiriambiojo darbo anotacija, kuri leidžia
spresti, jog planuojamame tyrimo neturėtų būti pažeistos tiriiamojo teisės, todėl šiam tyrimui
pritariama.

Bioetikos centro vadovas

doc. E. Peičius
Annex No. 2

Wexner skalė

Kortelės Nr.:..............................;
Data 20 / / d.

Pasirinkite vieną teisingiausią atsakymą. Iš anksto dėkojame

1. Ar Jus vargina kietų išmatų nelaiikymas?
   - □ a niekada;
   - □ b retai;
   - □ c kartais;
   - □ d dažnai;
   - □ e visada.

2. Ar Jus vargina skystų išmatų nelaiikymas?
   - □ a) niekada;
   - □ b) retai;
   - □ c) kartais;
   - □ d) dažnai;
   - □ e) visada.

3. Ar Jus vargina dujų nelaiikymas?
   - □ a) niekada;
   - □ b) retai;
   - □ c) kartais;
   - □ d) dažnai;
   - □ e) visada.

4. Ar dėl išmatų nelaiikymo Jums reikėjo nešioti sauskelnes ar įklotus?
   - □ a) niekada;
   - □ b) retai;
   - □ c) kartais;
   - □ d) dažnai;
   - □ e) visada.

5. Ar dėl išmatų nelaiikymo blogėja Jūsų gyvenimo kokybė?
   - □ a) neblogėja;
   - □ b) mažai blogėja;
   - □ c) pakankamai blogėja;
   - □ d) žymiai pablogėjo;
   - □ e) labai pablogėjo.

a – 0, b – 1, c – 2, d – 3, e – 4. Skalės vertė – balų suma. (0 – normali funkcija, 20 – visiškas nelaiikymas).
### Išmatų nelaikymo gyvenimo kokybės skalė (QoL)

**Kortelės Nr:** ...........................
**Data** 20 / / d.

1. Bendrai paėmus, jūs manote jūsų sveikata yra:
   - □ 1. Puiki;
   - □ 2. Labai gera;
   - □ 3. Gera;
   - □ 4. Vidutiniška;
   - □ 5. Bloga.

2. Prašau nurodykite, kiek laiko dėl išmatų nelaikymo kiekvienas iš žemiau nurodytų punktų jums kelia nerimą:

<table>
<thead>
<tr>
<th>Dėl išmatų nelaikymo</th>
<th>Labai dažnai</th>
<th>Kartais</th>
<th>Retail</th>
<th>Niekada</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Aš bijau išeiti į viešumą.</td>
<td>1 □</td>
<td>2 □</td>
<td>3 □</td>
<td>4 □</td>
</tr>
<tr>
<td>b. Aš vengiu lankyti draugus.</td>
<td>1 □</td>
<td>2 □</td>
<td>3 □</td>
<td>4 □</td>
</tr>
<tr>
<td>c. Aš vengiu nakvotį ne namie.</td>
<td>1 □</td>
<td>2 □</td>
<td>3 □</td>
<td>4 □</td>
</tr>
<tr>
<td>d. Man sunku išeiti ir daryti tokius dalykus kaip eiti į kino teatrą ar bažnyčią.</td>
<td>1 □</td>
<td>2 □</td>
<td>3 □</td>
<td>4 □</td>
</tr>
<tr>
<td>e. Aš atsižvelgę į suvalgyto maisto kiekį prieš išeidamas iš namų.</td>
<td>1 □</td>
<td>2 □</td>
<td>3 □</td>
<td>4 □</td>
</tr>
<tr>
<td>f. Aš stengiuosi laikytis kuo arčiau tualeto, kai tik nesu namie.</td>
<td>1 □</td>
<td>2 □</td>
<td>3 □</td>
<td>4 □</td>
</tr>
<tr>
<td>g. Aš planuojau savo dienotvarką, atsižvelgdama į savo tuštinimosi įpročius.</td>
<td>1 □</td>
<td>2 □</td>
<td>3 □</td>
<td>4 □</td>
</tr>
<tr>
<td>h. Aš vengiu keliau.</td>
<td>1 □</td>
<td>2 □</td>
<td>3 □</td>
<td>4 □</td>
</tr>
<tr>
<td>i. Aš jaudinuosi ar sugebėjau pasiekti tualetą laiku.</td>
<td>1 □</td>
<td>2 □</td>
<td>3 □</td>
<td>4 □</td>
</tr>
<tr>
<td>j. Aš jaučiu, jog visai nekontroliuoju savo tuštinimosi.</td>
<td>1 □</td>
<td>2 □</td>
<td>3 □</td>
<td>4 □</td>
</tr>
<tr>
<td>k. Aš negaliu atsitiktinio išmatų pakankamai ilgai, jog pasiekti tualetą.</td>
<td>1 □</td>
<td>2 □</td>
<td>3 □</td>
<td>4 □</td>
</tr>
<tr>
<td>l. Aš pasitūsinu, jog negaliu daryti daugelio dalykų, kuriuos norėčiau.</td>
<td>1 □</td>
<td>2 □</td>
<td>3 □</td>
<td>4 □</td>
</tr>
<tr>
<td>m. Aš stengiuosi išvengti nesusipratimų susijusių su išmatų nelaikymu.</td>
<td>1 □</td>
<td>2 □</td>
<td>3 □</td>
<td>4 □</td>
</tr>
</tbody>
</table>

3. Pažymėkite teiginius su kuriais SUTINKATE ar NESUTINKATE susijusius su išmatų nelaikymu:

<table>
<thead>
<tr>
<th>Dėl atsitiktinio išmatų nelaikymo</th>
<th>Visiškai sutinku</th>
<th>Iš dalies sutinku</th>
<th>Iš dalies nesutinku</th>
<th>Visiškai nesutinku</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Aš jaučiu gėdą.</td>
<td>1 □</td>
<td>2 □</td>
<td>3 □</td>
<td>4 □</td>
</tr>
<tr>
<td>b. Aš negaliu daryti daugelio dalykų, kuriuos norėčiau.</td>
<td>1 □</td>
<td>2 □</td>
<td>3 □</td>
<td>4 □</td>
</tr>
<tr>
<td>c. Aš jaudinuosi dėl išmatų nelaikymo.</td>
<td>1 □</td>
<td>2 □</td>
<td>3 □</td>
<td>4 □</td>
</tr>
<tr>
<td>d. Aš jaučiuosi prisilėgtas(a).</td>
<td>1 □</td>
<td>2 □</td>
<td>3 □</td>
<td>4 □</td>
</tr>
</tbody>
</table>
e. Aš nerimauju, jog aplinkiniai užūs mano blogą kvapą.  
   □ 1  □ 2  □ 3  □ 4

f. Aš jaučiuosi esantis nesveikas žmogus.  
   □ 1  □ 2  □ 3  □ 4

g. Aš mėgaujuosi gyvenimu mažiau.  
   □ 1  □ 2  □ 3  □ 4

h. Aš turėju lytinius santykius daug rečiau nei to norėčiau.  
   □ 1  □ 2  □ 3  □ 4

i. Aš jaučiuosi kitaip nei kiti žmonės.  
   □ 1  □ 2  □ 3  □ 4

j. Aš visada galvoju, kad galiu nelaukiai išmatų.  
   □ 1  □ 2  □ 3  □ 4

k. Aš bijau mylėtis.  
   □ 1  □ 2  □ 3  □ 4

l. Aš vengiu keliauti traukiniu ar lėktuvu.  
   □ 1  □ 2  □ 3  □ 4

m. Aš vengiu valgyti ne namie.  
   □ 1  □ 2  □ 3  □ 4

n. Būdamas(a) naujoje vietoje, visada išsiaiškinu, kur yra tualetas.  
   □ 1  □ 2  □ 3  □ 4

4. Ar per pastarajį mėnesį jūs jautėte liūdnas(a), nedraus(i), beviltiškas(a), jog susimąstėte ar dar kas nors gyvenime yra prasminga?
   □ 1. Visiškai teisingai – net maniau pasitraukti iš gyvenimo.
   □ 2. Taip.
   □ 3. Daugiau mažiau taip.
   □ 5. Retail.