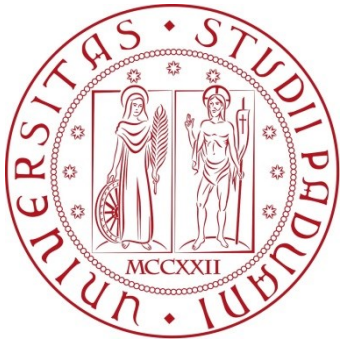

UNIVERSITÀ DEGLI STUDI DI PADOVA

Corso di Laurea Magistrale in Medicina e Chirurgia

Dipartimento di Scienze Chirurgiche, Oncologiche e Gastroenterologiche

Direttore: Chiar.mo Prof. Fabio Farinati

U.O.C. Chirurgia Generale 3

Direttore: Chiar.mo Prof. Salvatore Pucciarelli

TESI DI LAUREA

Racial disparities in Pelvic Floor Disorders in a tertiary referral center in London.

Relatrice: Prof.ssa Gaya Spolverato

Correlatrice: Dott.ssa Linda Ferrari

Laureanda: Carlotta Sarzo

N. matricola: 1176745

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SUMMARY

ABSTRACT

Introduzione: I disturbi del pavimento pelvico (DPP) sono comuni nel Regno Unito e includono il prolasso degli organi pelvici, l'incontinenza urinaria, l'incontinenza fecale e la defecazione ostruita. Al momento nessuna ricerca è stata condotta sulla disparità razziale nella gestione dei DPP colorettali.

Obiettivi: l'obiettivo primario di questo studio consiste nell'analisi delle disparità razziali nella diagnosi e trattamento dei DPP. L'obiettivo secondario è la valutazione delle disuguaglianze nella gestione DPP colorettali nei pazienti appartenenti a diversi livelli di stato socioeconomico quantificati usando l'indice di deprivazione multipla (IDM).

Metodi: Uno studio retrospettivo è stato condotto in un centro di terzo livello per i DPP a Londra. Per ogni paziente sono stati raccolti dati demografici e dati relativi a tutto il processo di cura e diagnosi dal 2013 al 2018. In totale sono state identificate 8 etnie. I pazienti sono stati classificati in base al punteggio IDM e divisi in quintili, combinando gruppi di decile adiacenti. Nel quintile più basso troviamo pazienti che vivono in zone più deprivate. Chi quadrato, ANOVA e il test di Kruskal-Wallis sono stati eseguiti per valutare come diagnosi e trattamento cambiassero con l'etnia e nei livelli di deprivazione.

Risultati: un totale di 2001 pazienti sono stati analizzati. 1126 pazienti sono stati inclusi per la prima parte dello studio e 875 sono stati esclusi a causa di dati incompleti relativi all'etnia. I pazienti Bianchi Britannici e Asiatici avevano maggiori probabilità di essere nei quintili di deprivazione più alti (meno disagiati). I risultati della prima parte hanno dimostrato che la stipsi era il disturbo più comune nella maggior parte dei gruppi etnici. I sintomi urinari erano più comuni nei pazienti Neri Britannici e di etnia Mista ($p=0,01$) mentre il dolore anale era più comune nei pazienti del groppo Nero-altro ($p=0,04$). I pazienti Bianchi-Britannici e Asiatici avevano una probabilità significativamente maggiore di essere visitati dal chirurgo ($p=0,001$) e di sottoporsi ad intervento chirurgico ($p=0,002$). Si è osservato che i pazienti del gruppo Altro e del gruppo Misto venivano maggiormente persi al follow up. Nella seconda parte dell'analisi, il gruppo finale oggetto di studio era di 1992 perché per 9 pazienti non è stato possibile calcolare l'IDM. L'età dei pazienti aumentava con l'aumentare dei quintili con i maschi prevalenti nel quintile di deprivazione più basso. Test diagnostici, discussione in meeting multidisciplinari, visite chirurgiche e trattamenti chirurgici erano significativamente inferiori nei due quintili più bassi ($p<0,001$, $p<0,001$, $p=0,02$, $p=0,02$).

Conclusione: È evidente che ci sono disparità nel trattamento chirurgico dei DPP nelle minoranze etniche. È stato identificato dove i pazienti appartenenti a minoranze hanno maggiori probabilità di essere svantaggiati nel servizio che ricevono. Inoltre, è stata dimostrata una relazione tra livello di deprivazione e gestione dell'assistenza per DPP: le persone che vivono in aree più svantaggiate sono trattate in modo diverso rispetto alle persone appartenenti ad un livello socioeconomico più elevato. Sebbene siano stati compiuti diversi progressi nei trattamenti DPP, l'assistenza equa non è stata ancora raggiunta per tutti. Questo studio può essere replicato in altre aree interessate per ridurre al minimo le disuguaglianze.

Background: Pelvic floor disorders (PFD) are common across the UK population and include pelvic organ prolapse, urinary incontinence, faecal incontinence and obstructed defecation. At present, no research has been previously done about racial disparity in treatment of obstructed defaecation and incontinence.

Objectives: the primary outcome of this study is to evaluate whether there are disparities in diagnosis and treatment of PFD amongst ethnic minorities. The secondary outcome of this study is to evaluate the presence of inequalities in diagnosis and treatment of patients with PFD based on the level of deprivation of their home location quantified by using the Index of Multiple Deprivation score (IMD).

Methods: A retrospective study was conducted in a tertiary centre for PFD from 2013 to 2018. For each patient demographic data and data related to the entire process of diagnosis and care were collected. In total 8 ethnicities were identified, and patients were categorized accordingly. Patients were classified by the IMD score and divided into quintiles, by combining adjacent decile groups. The lowest quintile represents most deprived. Chi squared, ANOVA and Kruskal-Wallis tests were performed to establish associations between variables and ethnicity first and then to evaluate relations between variables and IMD.

Results: For the first part of the study, 2001 patients were identified, 1126 patients included as 875 were excluded due to incomplete data. White British and Asian patients were most likely to be in the two highest IMD quintiles (less deprived). Constipation was the most common compliant in most groups. Urinary symptoms were most common in Black-British and Mixed patients ($p=0.01$) while anal pain was most common in the Black-Other group ($p=0.04$). White British and Asian patients were significantly more likely to be seen by a consultant ($p=0.001$) and to undergo surgery ($p=0.002$). Non-attendance was commonest in the Other ethnic group and the Mixed group.

In the second part of the analyses, we considered 1992 patients (9 excluded) who were categorized in quintiles based on the IMD score. Patients belonging to the lowest quintiles lived in more deprived areas while patients of the highest two quintiles lived in the least deprived areas. The age of patients increased with increasing quintile with males most prevalent in the lowest IMD quintile. Diagnostic tests, discussion in multidisciplinary meeting, consultant review and surgical treatments were significantly less in the two lowest quintiles ($p<0.001$, $p<0.001$, $p=0.02$, $p=0.02$).

Conclusion and relevance: Disparities in surgical treatment of PFD between ethnic minorities have been highlighted. It has been identified where patients are more likely to be disadvantaged in the service they receive due to their race. Moreover, a relation between level of deprivation and management of care for PFD has been demonstrated: people who lived in more deprived areas are treated in differently compared to people belonging to higher quintiles of deprivation. Although several progresses have been made in PFD treatments, the equitable care has not yet been achieved for everybody: minorities are still suffering from disparity in health care.

This study allows for replication of service provision frameworks in other affected areas to minimise inequalities.

CHAPTER 1 - INTRODUCTION

1.1 DEFINITION OF DISPARITY

Disparity in health care can be defined as a difference which is associated with a worsening of the patient's condition and outcome. This definition is well explained in Rathore S.S. et al. study. [1] They have tried to clarify the use of terms to indicate racial variations in medicine. Researchers usually refer to racial variations in treatment in terms of differences, disparity, and bias but these three are not equivalent. The use of "differences" may be confined for those situations in which it is not possible to assess which group is getting the worst care and outcome. It is possible to talk about disparity only when, even after controlling other patients' related factors, the outcome is adverse. At the end, it is possible to refer to racial variations as bias if the poorer outcome it is related to different administration of care due to race.

1.2 DISPARITY IN SURGERY

In recent literature the need to investigate disparities in medicine is emerging.

Roberts et al. [2] examined the existence of inequalities in surgical consultations after the admission to the emergency department in Black and White Medicare patients. Time is life in patients with emergency surgical diagnosis. Hence the immediate examination of the surgeon is fundamental. Their study showed that Black patients received fewer surgical consultations than White patients even after controlling for confounding factors such as comorbidities, socioeconomics factors and individual hospital level effects.

Another area that has been analyzed for the existence of ethnic disparities is surgical oncology. For instance, Joslin S.A. et al. found that African American women with early breast cancer had a higher rate of breast cancer surgery (BCS) not followed by radiotherapy compared to White women. [3]

A higher prevalence of late-stage rectal cancer has been observed in Black Americans [4] probably due to a greater difficulty in access to care and screening programs. Furthermore, racial differences in the administration of the various types of surgical treatments have been noticed: Black patients were more likely to be treated with a Miles (treatment which does not preserve the anal sphincter) associated with a lower quality of life, rather than an anterior resection of the rectum. Not only did the surgical treatment differed in the two groups, but also Black patients were less likely to receive pre-operative radiotherapy.

1.3 DISPARITY IN PELVIC FLOOR DISORDERS

Several studies have tried to investigate racial disparities in patients with Pelvic Floor Disorders (PFD). [5] [6]Most of the studies focused on urogynecological PFD.

Regards overactive bladder (OAB), Boyd B. et al performed a review which found some differences in prevalence: Black women seemed to have the higher prevalence of OAB compared to White women. Differences in treatment were also found: minorities were more likely to be treated with non-advance therapies. They were mostly treated with conservative methods such as oral medications like antimuscarins and beta3 agonists and for patients resistant to conservative treatment, advanced surgical therapies were less performed. [5] [6]

Moving to stress urinary incontinence, it seems more common in White women rather than in women of under-represented minorities. This is confirmed even in a setting where access to health care is equal for everyone, like in military structures, where there are no additional medical care costs. [5] [7] Moreover, a study showed that Black and Asian women with stress urinary incontinence were less likely to have surgery compared to White and Hispanic women. [8]

CHAPTER 2 - OBJECTIVE

The main aim of this study is the investigation of racial disparities in treatment of Colorectal Pelvic Floor Disorders. At this end, no one has evaluated difference in diagnosis and treatment of colorectal pelvic floor disorders in ethnic minorities.

Our hypothesis is that patients from ethnic minorities may present with different symptoms, may not be assessed with diagnostic tests properly, may undergo a shorter cycle of biofeedback appointments, may see a consultant in a different rate than other patients, may have been treated with surgery less frequently and may not attend the entire cycle of care.

The secondary outcome of this study is the evaluation of the relation between the Index of Multiple Deprivation (IMD) and the existence of health inequalities in the treatment of colorectal Pelvic Floor Disorders. Our hypothesis is that patients who live in more deprived areas may face health inequalities related to pelvic floor disorders.

CHAPTER 3 - DESIGN AND SETTING

This is a single institution retrospective study of patients with pelvic floor disorders who have been referred to a tertiary pelvic floor unit at St. Thomas' Hospital. Patients are referred by their General Practitioner (GP) or other hospitals and they are first analyzed by a specialist nurse in a telephone assessment triage.

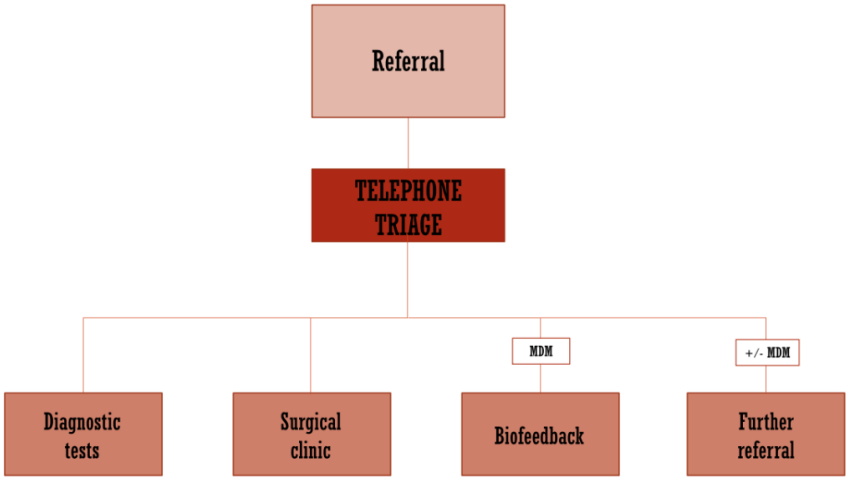

Figure 1 – Flowchart from the TTAC to other referrals from Ferrari et al. [9]

For no-English speaking patients, the telephone appointment is organized with a specialized interpreter.

We analyzed patients referred and treated between 2013 and 2018.

For each patient age, gender, ethnicity, and postcode were collected. In total 8 ethnicities were identified, and patients were categorized accordingly. Ethnic groups identified were White-British (WB), White-other (WO), Black-Caribbean (BC), Black-British (BB), Black-Other (BO), Asian (A), Mixed (M) and other (O) ethnic group.

The patient's multiple deprivation score was calculated using the English Indices of Deprivation measure 2019 (Index of Multiple deprivation 2019). [10] This can be considered the official measure of relative deprivation in England which considers 7 domains: income, employment, education, health, crime, carriers to housing services and living environment. The IMD goes from 1 to 10, with 1 representing the 10% most deprived and 10 being the 10% of

the least deprived. Patients were classified by the IMD score and divided into quintiles, by combining adjacent decile groups. The lowest quintile represents most deprived while the higher quintile represents the least deprived. We consider the IMD as a determinant of the Socio-Economic Factor. Of course, we must know that the SES may be influenced also by other factors such as level of instruction.

Variables of the study were: patients main complain, patient symptoms, consultant review, investigations, discussion in a Multidisciplinary meeting (MDM), number of biofeedback appointments, surgical treatment received and follow up appointments.

In particular, the following aspects have been assessed:

- relations between race and main complains;
- distribution of symptoms according to race;
- proportion of patients who did not attend the telephone assessment triage (DNA TTAC) according to race;
- outcomes from TTAC clinic race related;
- proportion of patients who underwent diagnostic tests according to race;
- proportion of patients who were discussed in a multidisciplinary meeting (MDM) according to race;
- proportion of patients who have been discussed in a Joint MDM according to race;
- proportion of patients who underwent biofeedback and number of appointments according to race;
- proportion of patients who have seen a consultant according to race;
- proportion of patients who underwent a surgical procedure according to race;
- proportion of patients who did not attend (DNA/DC, DC, ongoing) the treatment according to race;
- relation between race and IMD in order to understand if ethnic minorities really live in deprived areas.

A second analysis has been done to find how all these aspects related to the process of diagnosis and care may change with the level of deprivation.

3.1 PELVIC FLOOR DISORDERS OF THE POSTERIOR COMPARTMENT

Data about the entire process of diagnosis and care of patients with colorectal pelvic floor disorders have been collected.

3.1.1. DEFINITIONS AND EPIDEMIOLOGY

Obstructed defecation

The prevalence of obstructed defecation is about 7% of the adults with constipation and it predominantly affects women. [11] Obstructed defecation can be due to both mechanical and functional causes.

Anismus

A classic example of functional outlet obstruction is anismus. It is characterized by a higher anal pressure during defecation with a paradoxical contraction rather than a relaxation of the anal sphincters and the puborectalis muscles resulting in a non-adequate rectal emptying. It is a common finding in people who suffered from other symptoms such as fecal incontinence, perianal pain but also in women with a sexual abuse history. It can be considered an example of the brain-gut connection. [12]

Mechanical obstruction

Causes of mechanical obstructed defecation are high grade intussusception and rectocele. They are both consequences of chronic constipation, but they can also lead to maintain this condition. Other causes of anatomic obstruction are: enterocele and rectal prolapse, this later can be seen as a late stage of an intussusception or being caused by mucosal prolapse.

Rectocele

It is described as an out-pouching of the anterior rectal wall into the vagina. In terms of prevalence, a rectocele smaller than 2cm can be also found in 76% of healthy women. However, small (<2cm) asymptomatic rectoceles do not require any treatment and are considered a normal anatomical variant rather than a pathological finding. [13] [14]

A rectocele can be defined as “trapping rectocele” if feces are stuck in the pocket when assessed during defaecatory imaging such as, defaecating proctogram. [15]

Clinically it is described by patients as “bulge” sensation in the vagina, but other symptoms are present. In a group of 215 patients with rectocele, the main symptoms were obstructive

defaecation (97.2%), vaginal bulge (81.4%), anal incontinence (55.3%), fecal urgency (48.4%), vaginal splinting (46%), anal digitation (26%), constipation (18.1%), dyspareunia (7.9%) and urinary symptoms (67.9%). [16]

Intussusception

It can be defined as a telescoping invagination of the rectal wall. Following the Oxford grading system, intussusception can be classified into five grades when assessed on defaecating proctogram:

- grades I and II are consider normal, the invagination remains intrarectal;
- grades III and IV are pathological, the intussusception arrives at the anal canal;
- grade V is pathological, it is external, and it is also called rectal prolapse.

Faecal incontinence

Faecal incontinence (FI) is the involuntary loss of stool due to a disruption of the structural and functional integrity of the anal sphincters. Anal incontinence (AI) is defined as an involuntary loss of flatus, mucus and liquid or solid stool. [17]

The prevalence of FI estimated is about 1.4% and it raises with age. [18] A study showed that AI was less reported compared to other pelvic floor diseases, with a health seeking-behavior rate of 41%. [19]

According to Browning and Parks Classification, FI can be divided into four categories:

- grade 1 or continent;
- grade 2 incontinent to flatus;
- grade 3 incontinent to liquid stools and flatus incontinence;
- grade 4 incontinent to solid stools. [20]

The etiology of that can be related to different factors such as neurological diseases like trauma, Multiple Sclerosis, neuropathy; high volume of stool overwhelming normal sphincter function due to IBD, history of eating disorders with abuse of laxatives. Other causes of faecal incontinence are sexual abuse, connective tissues diseases and previous anorectal surgery and obstetric trauma. The latter is actually one of the most frequent causes of FI. [12]

There are different patterns of FI symptoms but in order to simplify, some authors divided them in two main categories: passive incontinence and urge incontinence. [12]

Obstetric anal sphincteric injuries (OASIS)

It is one of the main causes of AI in women. The estimated incidence seems to be close to 11%. [21] OASIS can be classified into four grades on endoanal ultrasound assessment according to the Sultan's Classification:

4 First-degree tear: the laceration is confined to the perineal skin or vaginal epithelium.

5 Second-degree tear: involvement of the perineal muscles.

6 Third-degree tear: there is an injury of the anal complex with an involvement of the External Anal Sphincter (EAS) with or without Internal Anal Sphincter (IAS) involvement.

7 Four-degree tear: the injury interests both the sphincters and also the anal epithelium.

The main risk factors associated with OASIS are high birth weight, assisted delivery with forceps, occipitoposterior fetal head position, prolonged second stage of labour and episiotomy. [21]

It has been suggested that the use of endoanal ultrasound may be helpful in intercepting those unacknowledged lesions which over time can cause anal incontinence. [22] The experience of an obstetric injury affects quality of life of women and may affects the future decision of having child. [23]

3.1.2 PELVIC FLOOR INVESTIGATIONS

The main investigations performed are integrated pelvic floor ultrasound, anorectal manometry and defecation proctography.

Correlation between symptoms of PFD and imaging findings is not always present. [24]

Integrated pelvic floor ultrasound

The integrated pelvic floor ultrasound (TPFUS) is a combination of trans perineal, endoanal and transvaginal ultrasound.

TPFUS has gained popularity due to several advantages: it is safe, well tolerated, radiation-free and it allows to obtain information about global pelvic floor disfunction.

The transperineal and transvaginal scans are performed with the patient in a supine position, legs flexed. The transperineal scan is performed with a convectional curved probe while the transvaginal scan is performed with a with a linear endoscopic probe. During each of these scans the patients is asked to squeeze, push and cough.

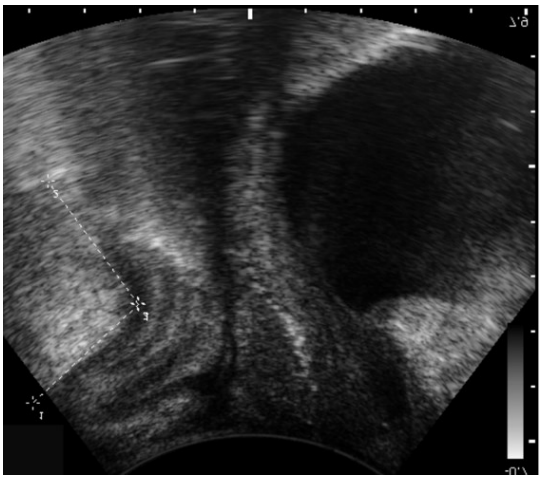

Figure 3 - An example of a transperineal scan kindly granted by St Thomas' Pelvic Floor Department.

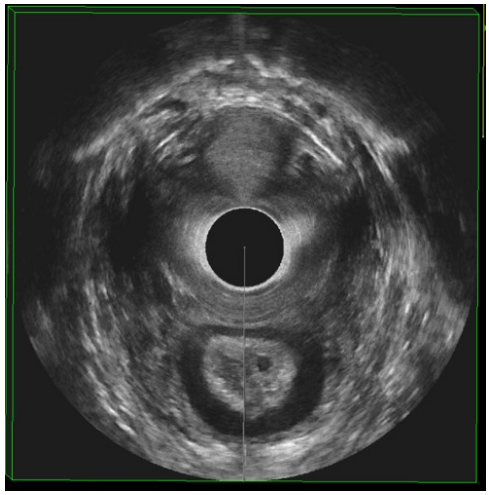

Figure 2 - An example of a transvaginal scan kindly granted by St Thomas' Pelvic Floor Department.

Endoanal ultrasound is performed in the prone position with 3D probe which has a sensor inside that rotates 360°. It shows, from the internal part to the external, the subepithelium, internal anal sphincter, longitudinal muscles, external anal sphincter and fat. There is also the possibility to acquire imagines in the sagittal view which is useful to see the length of the anal canal and obstetric injuries. [25]

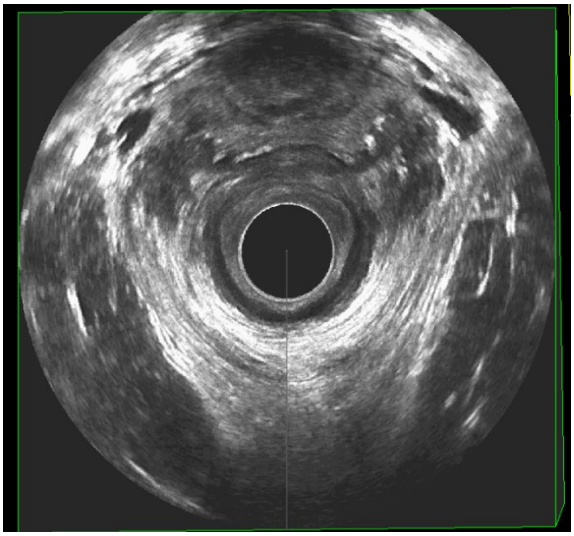

Figure 4 - An example of an endoanal us kindly granted by St Thomas' Pelvic Floor Department.

It has been demonstrated that TPFUS is a valid investigation for PFD it has a lower rate of false positive for surgical treatment than defaecatory proctography. [26]

Defaecatory proctography

It is an exam that allows to observe the process of defecation.

The initial counseling is important because fear or embarrassment may prevent expulsion of the rectal paste and effect the results obtained.

Fifteen minutes prior to starting the exam, the patient must be given oral Barium contrast and rectal paste. After that, images are obtained while the patient is seated in a commode, and asked to hold on the paste, to squeeze and to push it out.

Following the latest guidelines of the Consensus Meeting of the Pelvic Floor Consortium of the American Society of Colon and Rectal Surgeons, the good effort is defined when the patient can achieve a complete emptying after three times. [27]

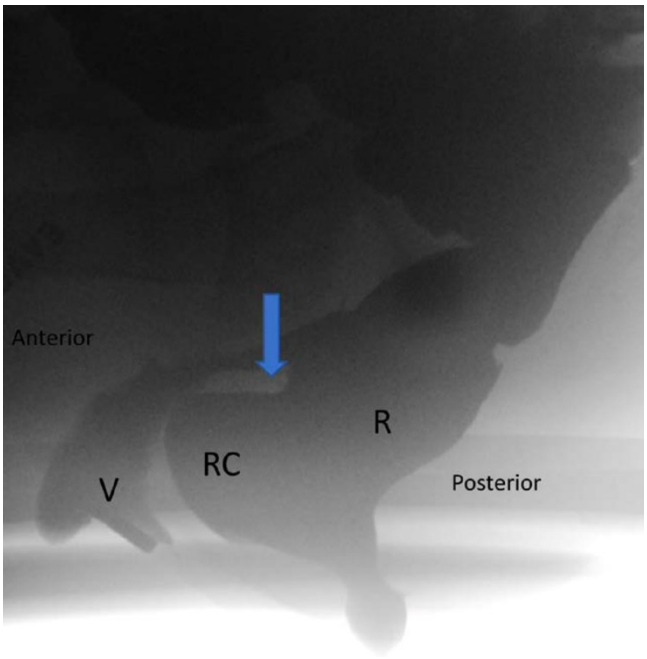

Figure 5 - example of a rectocele as it appears in a proctogram from Paquette et al [27]

Anorectal manometry

Anorectal manometry (ARM) is part of the anorectal function tests which also include rectal sensory test and balloon expulsion test.

Recently high-resolution ARM has been introduced. It differs from the non-high resolution due to the presence of many more sensors in the catheter.

Prior to starting, exams should be well explained, and consent acquired. The exam should be performed in the left lateral position with the legs flexed. A digital rectal examination should be performed to get an initial idea of the anorectal function and to understand if the patient executes the commands “push” and “squeeze” correctly.

The anorectal manometry measurements should be performed following the order of the IAWG protocol [28]. The catheter is inserted 60mm into the anal canal and the full protocol lasts approximately 12 minutes and it is described below.

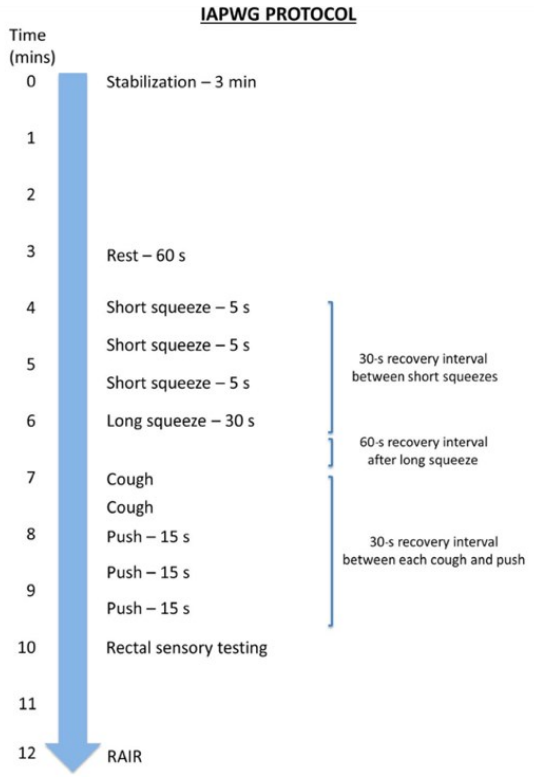

Figure 6 - IAPWG protocol from Carrigton et al. [28]

It is important to ensure that patients understood the commands they execute during the exam to avoid false results. [28]

3.1.3 TREATMENTS

Pelvic floor disorders of different compartments usually come together, and it is more correct to refer to global pelvic floor dysfunction. Hence the treatment of these conditions must be multidisciplinary. [12]

Treatments for pelvic floor defaecatory disfunction can be divided into conservative measures and surgical options. The conservative approach is reserved, as a first line of therapy.

Surgical treatment must be administrated if patients are symptomatic and have anatomical abnormalities. [24]

Conservative treatments

Biofeedback has been initially indicated for the management of faecal incontinence (FI) and later for chronic constipation. [29]

In patients with FI, it aims to improve the contraction of the external anal sphincter and to coordinate better sphincters contraction to rectal distension. The effectiveness of biofeedback in faecal incontinence varies from 50-92%. [30] Constipated patients are thought to relax the muscles during defeacation effort. Rao et al. have demonstrated that after biofeedback the 76% of a sample of 26 patient with obstructed defaecation improved the anorectal function. [31]

Another conservative option for defecatory disorders are medications. In case of incontinence there is the possibility to try stool bulking medications such as Loperamide or enemas or suppositories to empty the bowel to prevent accidents. In patients with constipation, there is the possibility to try osmotic or stimulating laxatives, prokinetics, enemas and suppositories.

Anorectal irrigation is a conservative treatment for both anal incontinence and constipation. It is used as a second option when other conservative treatments fail. [32]

Anorectal irrigation is performed by inserting a catheter that sprays water into the anus. The irrigation catheter is connected with a bag which is located at 1 m from the ground in order to use gravity to maintain the water flow. It should be performed daily although each patient should find his personal frequency of irrigation. [33]

It is a safe, minimally invasive, reversable procedure; however, we must take into account that there is a risk of bowel perforation due to the introduction of the catheter. [33] The discontinuation rate is quite high, probably due to technical problems, inefficacy and the fact that is may be time consuming. [32]

Surgical treatments

Surgical correction of anatomical abnormalities may help to improve symptoms. However, due to the complexity of the pelvic floor, the operation may not resolve all the symptoms. [24] Surgeons must explain this to patients who may be hoping for complete resolution of their condition. We must always keep in mind that surgeon's success may not be what the patients expect, and patient expectations must be managed.

Surgery for rectocele steps in when conservative treatment failed and, at the same time, there is an anatomical abnormality to correct.

The indication for surgical treatment is for symptomatic patients with defecography evidence of a rectocele bigger than 2 cm which causes trapping. In terms of grade, surgery may be indicated for moderate (2 – 4cm) and large (>4cm) rectoceles. [15]

There are several approaches to the reinforcement the rectovaginal septum.

It may be repaired with:

- transvaginal approach;
- transperinal approach;
- trans anal approach;
- abdominal approach.

It suggested a conservative biofeedback treatment to improve pelvic floor function after the surgery. [16]

Grossi et al. review the main harms associated with a rectocele repair and found that the complication rate goes from 0% to 61%. The common complication was mesh erosion, when vaginal mesh was still an option, while bleeding, sepsis, fistulations were rare. Recurrence of rectocele was evidenced in 17% of patients. [15]

The invagination of the rectum in intussusception determinates a block in evacuating stool. Surgery may be an option to resolve symptoms. The surgical treatment approach may be perineal. Some examples of the perineal approach are the Delorme's procedure and the Altemeier' s procedure. The abdominal approaches include the rectopexy with or without mesh and the sigmoid resection with rectopexy. [34]

The right selection of patients that can benefit from surgery is challenging. Grossi et al. in their systematic review observed that there was not a consensus in the indications of these procedures however, the most frequent was high grade intussusception with Oxford grade ≥3. The same authors showed that intussusception can be corrected with ventral mesh rectopexy in 80-100% of patients. [35]

It can be described as lifting up of the rectum to prevent its invagination during evacuation effort. During a ventral mesh rectopexy the rectum is lifted up and attached to the sacrum. Alternatively, there is the possibility to perform a suture rectopexy in which the rectum is attached to the sacrum through sutures, without using mesh.

Rectopexy can be done both laparoscopic and robotic. Rondelli et al. meta-analyzed the two procedures and found that robotic rectopexy is associated with a lower intraoperative blood

loss, lower rate of post-operative complications and a shorter length of hospital stay when compared to the laparoscopic approach. [34]

Although FDA has reported a high mesh related complications in transvaginal repair of pelvic organ prolapse [36], a study showed that in a group of 919 patients who underwent a laparoscopic ventral mesh rectopexy, after 5 years just the 2.9% of them developed mesh complications. [20]

The main indication to rectal excision is in obstructed defecation symptomatic patients with anatomical abnormalities such as rectocele or intussusception seen at defecography. [37]

The Delorme procedure has been modified with the passing of time and nowadays there are several types of Modified Delorme's procedure.

Briefly, Delorme's procedure starts with an epinephrine injection of the rectum mucosa, then the mucosa is incised and the muscolaris is exposed. After that the muscolaris is plicated and an anastomosis between the two mucosal sides is performed. [38]

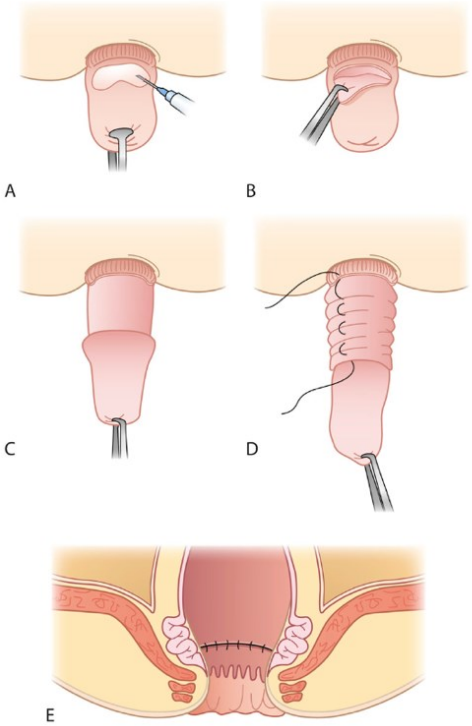

Figure 7 - Explanation of the Delorme' s procedure from Sabiston Textbook of Surgery [38]

In a systematic review it has been demonstrated that rectal wall excision procedures are secure. Some of the complications that patients may develop are post-operative bleeding (1-3%), sepsis and anastomotic dehiscence which are quite rare (1%). [39] [40]

Patients who undergo one of these procedures have a higher risk of future faecal urgency while prolapse recurrence was seen in 4.3% of them. The post operative risk of faecal incontinence is linked to the continuous traumatism of the sphincters exerted by the invaginated intestine and to the procedure itself. [39] Despite that, 75-80% of patients seem to be satisfied.

Another surgical option for rectal prolapse is the Altemeier' s procedure. It is a procedure widely used in America even though the first perineal rectosigmoidectomy was described in France in 1882. It is performed with the patients prone in Jackknife position.

During the Altermeier's procedure a circumferential cut above 2 cm of the prolapsed rectum is made. The mesorectum is divided circumferentially. The prolapsed rectum is excised. The elevator muscles can be sutured anteriorly in order to improve continence and the coloanal anastomosis is performed. [41]

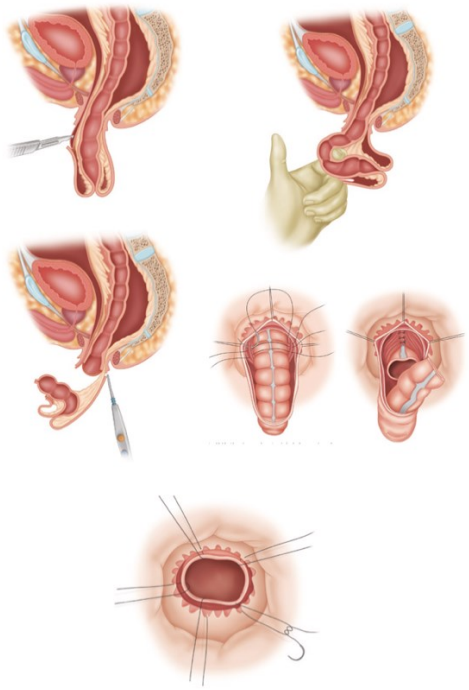

Figure 8 - Altemeier's procedure illustrations [41]

Cirocco W.C. demonstrated that Altemeier's procedure can improve constipation in 94% of the sample patients of his study and faecal incontinence improved in 85% of them. However, 15% of patients experienced some sense sphincteric dysfunction with leakage in the post-operative period. [42]

Sacral nerve stimulation (SNS) is a treatment for patients with faecal incontinence which consists of an implantation of a device that sends impulses to the sacral nerves that control continence function. SNS is a second level treatment for incontinent patients who failed conservative approach.

Usually, patients can first benefit from a test period using a temporary device for 2-4 weeks, before moving to a permanent stimulator. The main nerve root being stimulated is the S3. [43] There is evidence that SNS can be use not only in patients with weak anal sphincters but also in patients with a damaged external anal sphincter. [43]

Sphincteroplasty is a surgical treatment for faecal incontinence in presence of damaged sphincters.

General anesthesia is usually required, and the surgery is performed in the Jackknife position. The perineal body is incised in a curvilinear way. Then the damaged sphincters are dissected and divided. The two ends of the sphincteric muscles are overlapped. Surgeons must pay attention to the course of pudendal nerve. [41]

Although sphincteroplasty outcome is good at first, the long term outcome is not so satisfactory; for example Gutierez et al. demonstrated that after 10 years 62% of patients were incontinent, however most of them still experienced an improvement of their symptoms and their quality of life compared to what they had before surgery. [44]

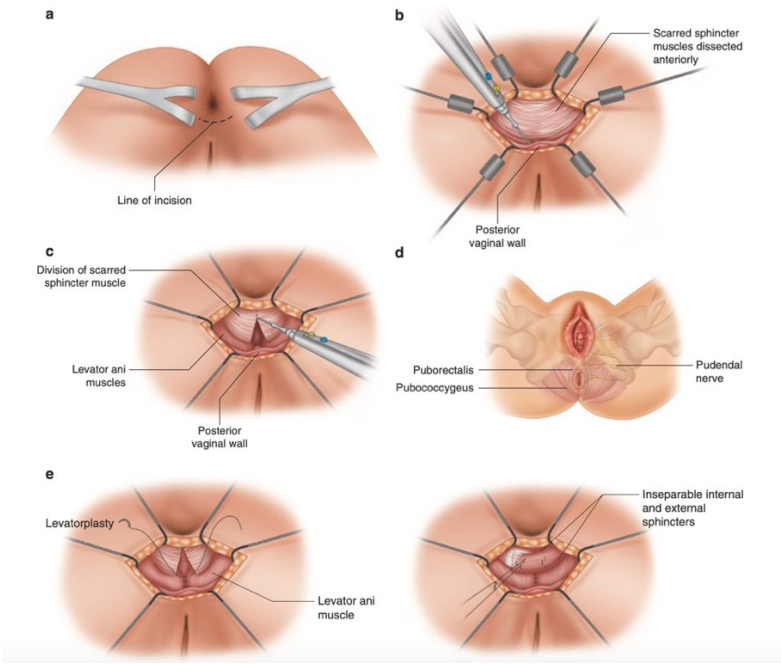

Figure 9 - Anterior sphincteroplasty from ASCRS textbook of colon and rectal surgery [41]

3.4 STATISTICAL ANALYSIS

Categorical variables are summarised by the number and percentage of responses in each category. Continuous variables are summarised by the mean and standard deviation if normally distributed, and the median and inter-quartile range if not.

Categorical variables were compared between groups using the Chi-square test. Continuous variables were compared between groups using Analysis of Variance (ANOVA) for factors found to be normally distributed and using the Kruskal-Wallis test if not normally distributed.

CHAPTER 4 – RESULTS

The first set of analyses compared between patients of different ethnicity.

A summary of the analysis results is shown in Tables 1 – 4, located at the end of the chapter.

2001 patients were identified, 1126 patients were included for the first part of the study as 875 were excluded due to incomplete data.

The results for demographics and main complaint suggested that age, Index of Multiple Deprivation and main complaint varied significantly between ethnic groups, but that there was no significant difference in gender.

Mixed patients were the youngest (mean age 44), with Black Other patients being the next youngest. White British, White Other and Black Caribbean patients were the oldest, with White British patients having a mean age of 55.

The deprivation results suggested that White British and Asian patients were most likely to be in the upper quintiles, suggesting least deprivation. The 28% and 29% of White British and Asian patients were in the top two quintiles. This contrasted with no patients in the Black Other group, and only 3% in the Black British group.

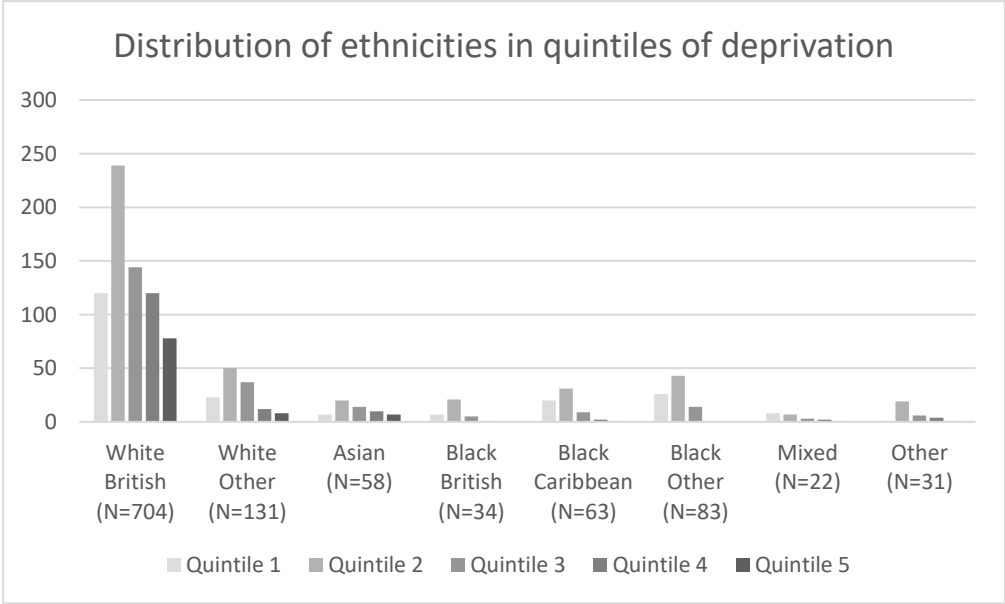

Figure 10 - Distribution of ethnicities in quintiles of deprivation

ODS/constipation was the most common compliant in most ethnic groups, although was highest in the Other category (57% of this group). In Asians, anal incontinence was the most common compliant (36% of patients), slightly more common than ODS/constipation.

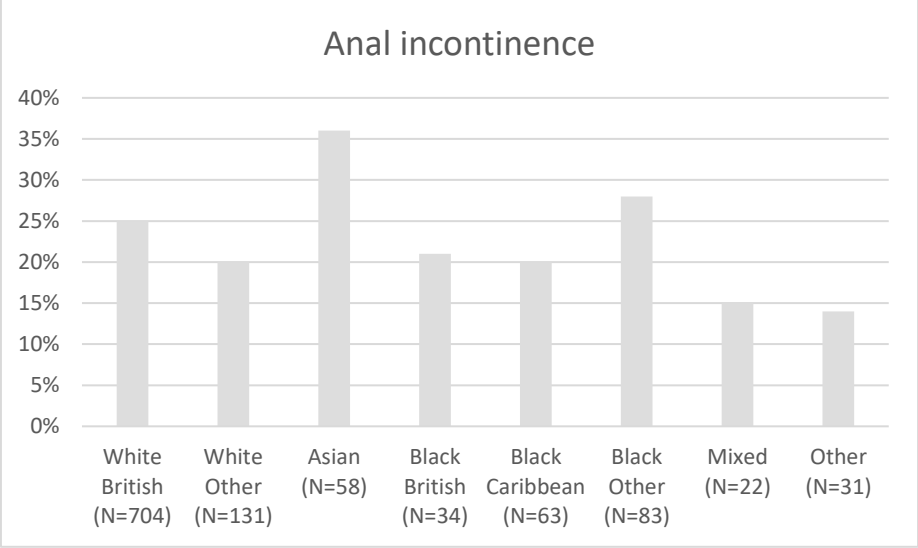

Figure 11 - Frequency of anal incontinence in ethnic groups

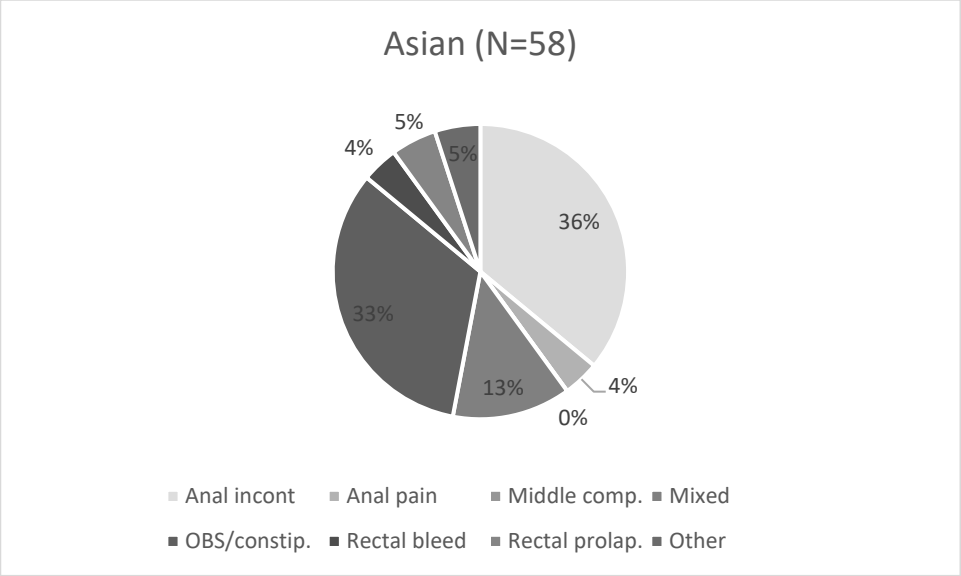

Figure 12 - Distribution of main complaints in Asian patients

The majority of symptoms were not found to vary between ethnic groups, with no over-all differences for constipation, incontinence, prolapse, vaginal bulge and other symptoms. However, differences were observed for urinary symptoms and pain. Urinary symptoms were most common in Black British patients (32% of this group had these symptoms) and Mixed

patients (41%) with a p=0.01, and least common in White British and White Other groups (15% and 16% respectively). Anal pain was most common in the Black Other group (5%), and least common in Other and Black British groups (p=0.04).

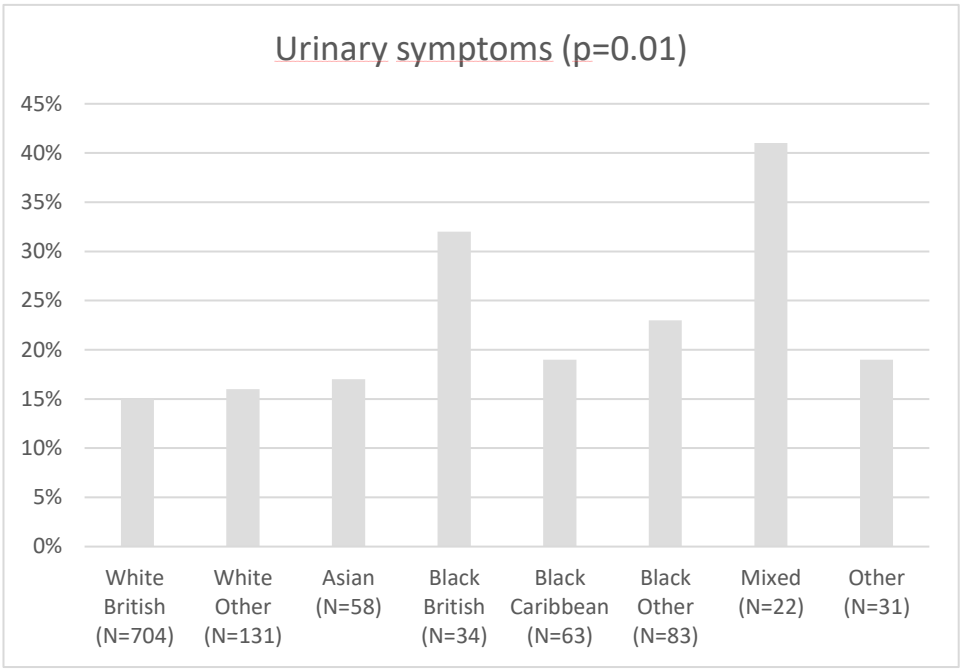

Figure 13 - Frequency of urinary symptoms in ethnic groups

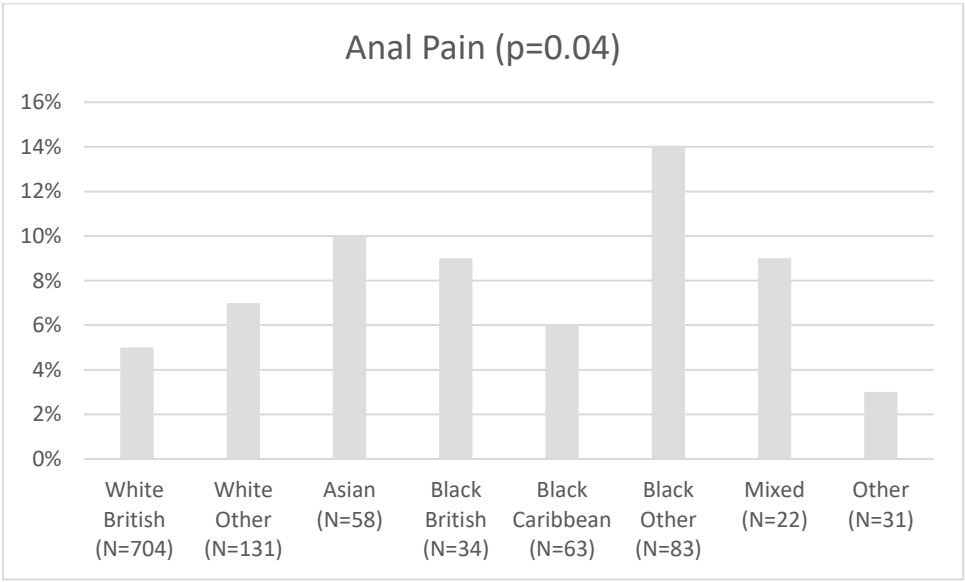

Figure 14 - Frequency of symptoms of anal pain in ethnic groups

The ethnic groups differed significant in terms of did not attending (DNA) TTAC appointments (Table 3). DNA was most common in the Other ethnic group (10%) and the Mixed group (14%). However, only 2% of the White British and White Other groups did not make their appointments.

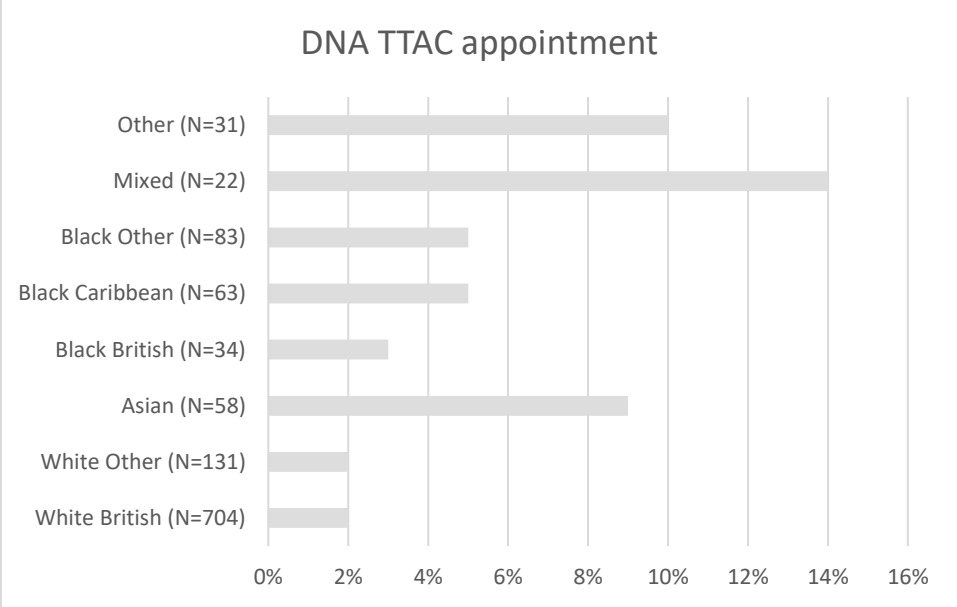

Figure 15 – DNA TTAC appointments rate

The referrals from TTAC to Biofeedback (BFB), TTAC to consultant clinic and TTAC to tests were not significantly different between the ethnic groups. Diagnostic tests, discussion in the MDM, the use of biofeedback and treatment outcome also did not vary significantly between the ethnicities.

Statistically significant differences between ethnic groups were found for being seen by a consultant and undergoing a surgical procedure ($p=0.001$, $p=0.002$). The White British and Asian groups were most likely to be seen by a consultant (38% and 43% of patients respectively), with the Black British and Black Other groups least likely (15% and 19% of patients). The White British and Asian groups were also more likely to have undergone a surgical procedure (17% and 12% respectively), with the Black British and Black Other groups the least likely (3% and 4% of patients in these ethnic groups).

Although not statistically significant, ethnic groups differed in terms of outcomes: Mixed and Other groups were most likely to be lost on follow up.

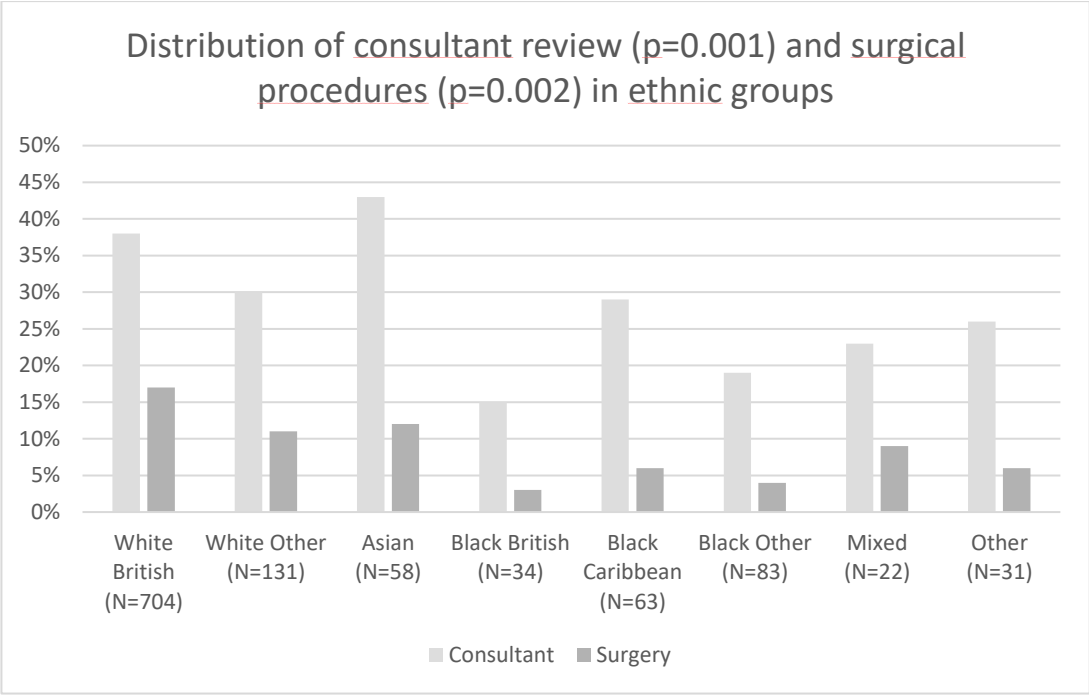

Figure 16 - Distribution of consultant review (p=0.001) and surgical procedures (p=0.002) in ethnic groups

A second set of analyses examined differences between patients based on the level of deprivation of their home location. The Index of Multiple Deprivation score has been calculated for 1992 patients and they were divided into quintiles, by combining adjacent decile groups. Comparisons between the five groups were made. The analysis results are summarised in Tables 5 – 8, at the end of the chapter.

The results for the demographic variables suggested a significant difference between deprivation groups for age and gender, but no significant difference for the main compliant. The age of the patients steadily increased with increasing quintile representing a lower level of deprivation ($p<0.001$). Patients in the first quintile had a mean age of 51, increasing up to a mean of almost 56 for the upper quintile. The percentage of male patients was highest in the lowest quintile (most deprived), with 18% male ($p=0.03$). This decreased with lower levels of depression, down to 11% in the upper quintile.

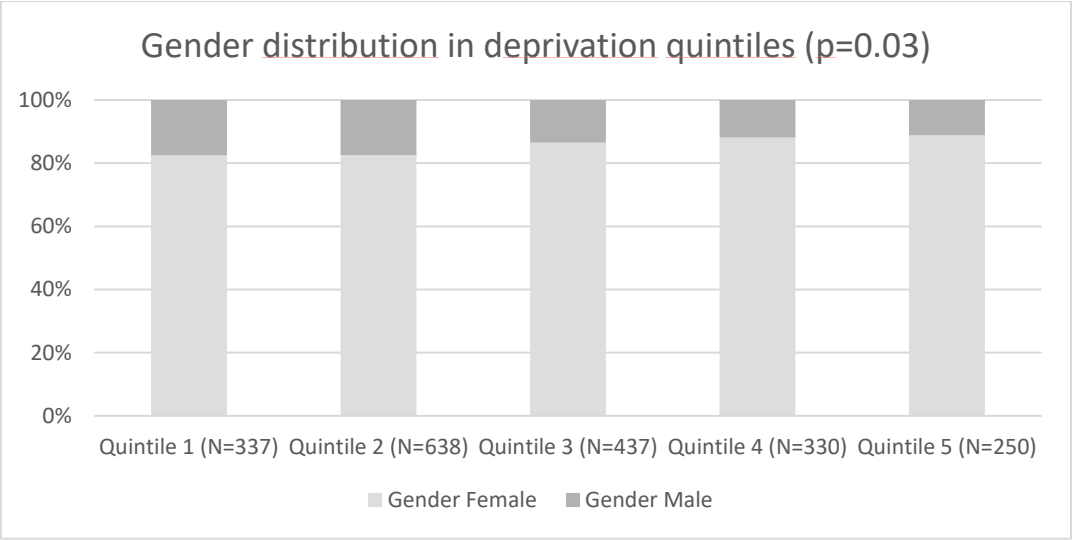

Figure 17- Gender distribution in Deprivation quintiles

There was no strong evidence that any of the symptoms varied significantly between the deprivation groups (Table 6).

TTAC to BFB and TTAC to test variables both were significantly different between groups (p=0.01, p=0.001). TTAC to BFB was most common in the two lowest quintiles (15% and 20% of patients), and lowest in the two upper quintiles. Conversely, TTAC to tests was lowest in the lowest quintiles (highest levels of deprivation) and most common in the upper quintiles. The TTAC to consultant clinic outcome did not vary significantly between deprivation groups.

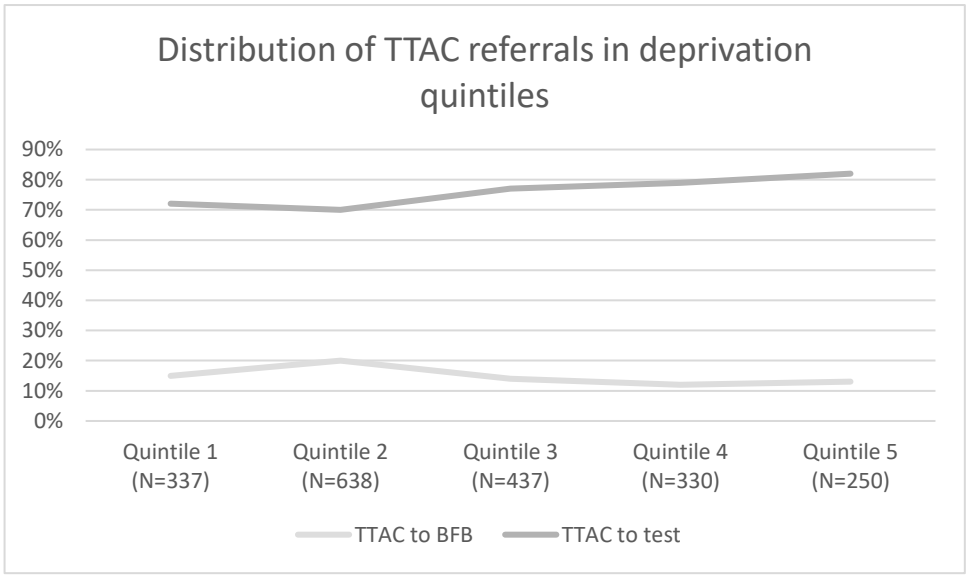

Figure 18 - Distribution of TTAC referrals in deprivation quintiles

The use of diagnostic tests and discussion in the MDM both varied significantly between deprivation groups ($p<0.001$). The use of diagnostic tests was least common in the two lowest quintiles (most deprived) and most common in the highest quintile. A similar pattern was seen for discussion in the MDM, where this was least common in the two lowest quintiles (72% and 71% of patients respectively), and most common in the upper quintile (84% of patients).

Similar results were observed for whether the patient was seen by a consultant and whether they underwent a surgical procedure ($p=0.02$, $p=0.02$), both of which were least common in the two lowest quintiles (most deprived patients) and most common in the upper quintile (least deprived).

The use of biofeedback and the number of occurrences of biofeedback did not vary significantly between the deprivation groups.

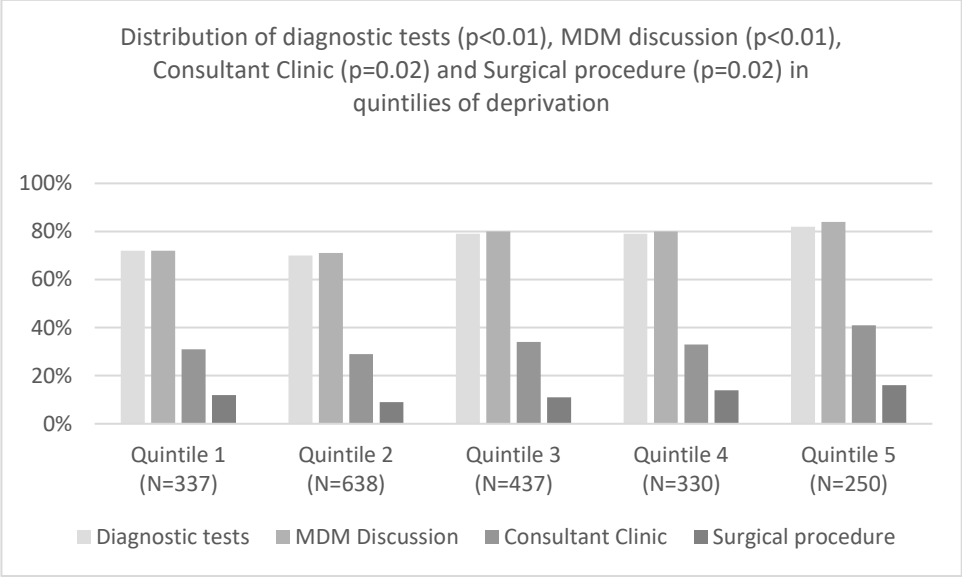

Figure 19 - Distribution of diagnostic tests, MDM discussion, consultant review and surgery in deprivation groups

There was slight evidence that the treatment outcome varied between deprivation groups, but the difference did not quite reach statistical significance. The trend was towards a higher occurrence of discharge to GP in the upper quintiles, with these groups being less likely to be in the DNA / discharged category.

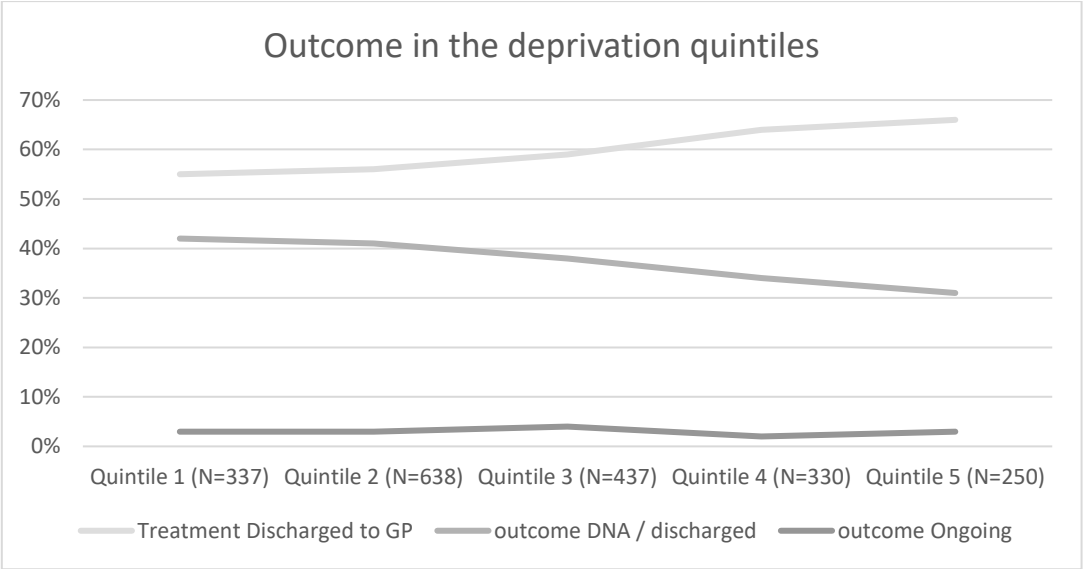

Figure 20 - Outcomes distribution in deprivation quintiles

Table 1-Demographics / main complaint by ethnicity

Factor	Category	White Brit (N=704)	White Oth (N=131)	Asian (N=58)	Black Brit (N=34)	Black Carib (N=63)	Black Oth (N=83)	Mixed (N=22)	Other (N=31)	P-value
Age	-	55.1 ± 15.5	53.1 ± 15.7	49.6 ± 16.0	50.0 ± 13.8	54.3 ± 15.6	46.5 ± 13.6	44.3 ± 10.4	48.4 ± 15.6	**<0.001**
Gender	Female	591 (84%)	113 (86%)	47 (81%)	29 (85%)	54 (86%)	70 (84%)	20 (91%)	25 (81%)	0.96
	Male	112 (16%)	18 (14%)	11 (19%)	5 (15%)	9 (14%)	13 (16%)	2 (9%)	6 (19%)	
IMD	Quintile 1	120 (17%)	23 (18%)	7 (12%)	7 (21%)	20 (32%)	26 (31%)	8 (38%)	1 (3%)	**<0.001**
	Quintile 2	239 (34%)	50 (38%)	20 (34%)	21 (62%)	31 (49%)	43 (52%)	7 (33%)	19 (61%)	
	Quintile 3	144 (21%)	37 (28%)	14 (24%)	5 (15%)	9 (14%)	14 (17%)	3 (14%)	6 (19%)	
	Quintile 4	120 (17%)	12 (9%)	10 (17%)	1 (3%)	2 (3%)	0 (0%)	2 (10%)	4 (13%)	
	Quintile 5	78 (11%)	8 (6%)	7 (12%)	0 (0%)	1 (2%)	0 (0%)	1 (5%)	1 (3%)	
Main com-plaint	Anal incont	174 (25%)	26 (20%)	20 (36%)	7 (21%)	12 (20%)	22 (28%)	3 (15%)	4 (14%)	**0.03**
	Anal pain	8 (1%)	1 (1%)	2 (4%)	1 (3%)	0 (0%)	4 (5%)	0 (0%)	0 (0%)	
	Middle comp.	20 (3%)	5 (4%)	0 (0%)	0 (0%)	0 (0%)	1 (1%)	0 (0%)	0 (0%)	
	Mixed	146 (21%)	26 (20%)	7 (13%)	6 (18%)	13 (22%)	20 (25%)	5 (25%)	8 (29%)	
	OBS/constip.	286 (41%)	59 (46%)	18 (33%)	16 (48%)	30 (50%)	29 (36%)	10 (50%)	16 (57%)	
	Rectal bleed	8 (1%)	1 (1%)	2 (4%)	0 (0%)	0 (0%)	2 (3%)	2 (10%)	0 (0%)	
	Rectal pro-lap.	34 (5%)	3 (2%)	3 (5%)	1 (3%)	1 (2%)	2 (3%)	0 (0%)	0 (0%)	

	Other	18 (3%)	8 (6%)	3 (5%)	2 (6%)	4 (7%)	0 (0%)	0 (0%)	0 (0%)	

Table 2-Symptoms by ethnicity

Symptom	White Brit-ish (N=704)	White Other (N=131)	Asian (N=58)	Black Brit-ish (N=34)	Black Carib (N=63)	Black Other (N=83)	Mixed (N=22)	Other (N=31)	P-value
Constipation	402 (57%)	80 (61%)	23 (40%)	21 (62%)	36 (57%)	44 (53%)	12 (55%)	22 (71%)	0.12
Incontinence	299 (42%)	48 (36%)	24 (41%)	12 (35%)	25 (40%)	40 (48%)	7 (32%)	8 (26%)	0.36
Prolapse	51 (7%)	6 (5%)	4 (7%)	3 (9%)	2 (3%)	5 (6%)	5 (23%)	2 (7%)	0.12
Urinary	107 (15%)	21 (16%)	10 (17%)	11 (32%)	12 (19%)	19 (23%)	9 (41%)	6 (19%)	**0.01**
Vaginal bulge	54 (8%)	8 (6%)	4 (7%)	5 (15%)	3 (5%)	8 (10%)	1 (5%)	3 (10%)	0.71
Pain	34 (5%)	9 (7%)	6 (10%)	3 (9%)	4 (6%)	12 (14%)	2 (9%)	1 (3%)	**0.04**
Other sympt.	48 (7%)	11 (8%)	5 (9%)	1 (3%)	1 (2%)	5 (6%)	3 (14%)	2 (6%)	0.53

Table 3-Assessment / clinic outcomes by ethnicity (part 1)

Outcome	Category	White Brit (N=704)	White Oth (N=131)	Asian (N=58)	Black Brit (N=34)	Black Carib (N=63)	Black Oth (N=83)	Mixed (N=22)	Other (N=31)	P-value
DNA TTAC	No	691 (98%)	129 (98%)	53 (91%)	33 (97%)	60 (95%)	79 (95%)	19 (86%)	28 (90%)	**0.001**
appointment	Yes	13 (2%)	2 (2%)	5 (9%)	1 (3%)	3 (5%)	4 (5%)	3 (14%)	3 (10%)	
TTAC to	No	585 (83%)	107 (82%)	47 (81%)	28 (82%)	48 (76%)	69 (83%)	18 (82%)	27 (87%)	0.92
BFB	Yes	119 (17%)	24 (18%)	11 (19%)	6 (18%)	15 (24%)	14 (17%)	4 (18%)	4 (13%)	
TTAC to	No	682 (97%)	126 (96%)	55 (95%)	33 (97%)	62 (98%)	81 (98%)	22 (100%)	29 (94%)	0.85
Cons clinic	Yes	22 (3%)	5 (4%)	3 (5%)	1 (3%)	1 (2%)	2 (2%)	0 (0%)	2 (6%)	

TTAC to test	No	180 (25%)	33 (25%)	17 (29%)	10 (29%)	24 (38%)	25 (30%)	9 (41%)	10 (32%)	0.33
	Yes	524 (74%)	98 (75%)	41 (71%)	24 (71%)	39 (62%)	58 (70%)	13 (59%)	21 (74%)	

Table 4-Assessment / clinic outcomes by ethnicity (part 2)

Outcome	Category	White Brit (N=704)	White Oth (N=131)	Asian (N=58)	Black Brit (N=34)	Black Carib (N=63)	Black Oth (N=83)	Mixed (N=22)	Other (N=31)	P-value
Diagnostic tests	No	180 (26%)	33 (25%)	15 (29%)	10 (29%)	22 (35%)	26 (31%)	9 (41%)	10 (32%)	0.49
	Yes	524 (74%)	98 (75%)	43 (74%)	24 (71%)	41 (65%)	57 (69%)	13 (59%)	21 (68%)	
Discussed in MDM	No	181 (26%)	33 (25%)	13 (22%)	10 (29%)	20 (32%)	20 (24%)	8 (36%)	10 (32%)	0.81
	Yes	523 (74%)	98 (75%)	45 (78%)	24 (71%)	43 (68%)	63 (76%)	17 (64%)	21 (68%)	
Biofeedback	No	129 (18%)	27 (21%)	15 (26%)	6 (18%)	14 (22%)	20 (24%)	7 (32%)	7 (23%)	0.57
	Yes	57 (82%)	104 (79%)	43 (74%)	28 (82%)	49 (78%)	63 (76%)	15 (68%)	24 (77%)	
Biof numb	-	3 [2, 6]	3 [1, 5]	3 [0, 6]	3 [2, 4]	3 [1, 6]	2 [1, 5]	2 [0, 6]	3 [1, 6]	0.46
Seen consultant	No	439 (62%)	92 (70%)	33 (57%)	29 (85%)	45 (71%)	67 (81%)	17 (77%)	23 (74%)	**0.001**
	Yes	265 (38%)	39 (30%)	25 (43%)	5 (15%)	18 (29%)	16 (19%)	5 (23%)	8 (26%)	
Surgical procedure	No	586 (83%)	117 (89%)	51 (88%)	33 (97%)	59 (94%)	80 (96%)	20 (91%)	29 (94%)	**0.002**
	Yes	118 (17%)	14 (11%)	7 (12%)	1 (3%)	4 (6%)	3 (4%)	2 (9%)	2 (6%)	
Treatment	Discharge GP	425 (60%)	78 (60%)	30 (52%)	19 (56%)	38 (60%)	43 (52%)	11 (50%)	12 (39%)	0.28

outcome	DNA/disch. Ongoing	255 (36%) 24 (3%)	50 (38%) 3 (2%)	25 (43%) 3 (5%)	14 (41%) 1 (3%)	25 (40%) 0 (0%)	38 (46%) 2 (2%)	11 (50%) 0 (0%)	19 (61%) 0 (0%)	

Table 5-Demographics / main complaint by level of deprivation

Factor	Category	Quintile 1 (N=337)	Quintile 2 (N=638)	Quintile 3 (N=437)	Quintile 4 (N=330)	Quintile 5 (N=250)	P-value
Age	-	51.0 ± 15.1	51.8 ± 14.9	52.2 ± 15.8	54.9 ± 16.4	55.8 ± 15.9	**<0.001**
Gender	Female	277 (82%)	527 (83%)	378 (86%)	291 (88%)	222 (89%)	**0.03**
	Male	59 (18%)	111 (17%)	59 (14%)	39 (12%)	28 (11%)	
Main complaint	Anal incontinence	89 (27%)	153 (25%)	117 (327%)	85 (27%)	66 (27%)	0.16
	Anal pain	6 (2%)	10 (2%)	2 (<1%)	2 (1%)	4 (2%)	
	Middle compartment	4 (1%)	17 (3%)	7 (2%)	1 (<1%)	9 (4%)	
	Mixed	68 (21%)	128 (21%)	91 (21%)	67 (21%)	51 (21%)	
	OBS/constipation	129 (40%)	269 (43%)	182 (42%)	139 (43%)	98 (40%)	
	Rectal bleeding	3 (1%)	8 (1%)	3 (1%)	3 (1%)	0 (0%)	
	Rectal prolapse	18 (6%)	16 (3%)	18 (4%)	16 (5%)	17 (7%)	
	Other	8 (2%)	22 (4%)	11 (3%)	7 (2%)	3 (1%)	

Table 6-Symptoms by level of deprivation

Symptom	Quintile 1 (N=337)	Quintile 2 (N=638)	Quintile 3 (N=437)	Quintile 4 (N=330)	Quintile 5 (N=250)	P-value
Constipation	178 (53%)	363 (57%)	244 (56%)	177 (54%)	139 (56%)	0.75
Incontinence	158 (47%)	255 (40%)	192 (44%)	142 (43%)	110 (44%)	0.32

Prolapse	29 (9%)	34 (5%)	33 (8%)	23 (7%)	26 (10%)	0.09
Urinary	60 (18%)	111 (17%)	77 (18%)	54 (16%)	53 (21%)	0.64
Vaginal bulge	18 (5%)	45 (7%)	32 (7%)	20 (6%)	27 (11%)	0.12
Pain	26 (8%)	47 (7%)	24 (5%)	25 (8%)	15 (6%)	0.65
Other symptoms	19 (6%)	48 (8%)	27 (6%)	24 (7%)	9 (4%)	0.25

Table 7-Assessment / clinic outcomes by level of deprivation (part 1)

Outcome	Category	Quintile 1 (N=337)	Quintile 2 (N=638)	Quintile 3 (N=437)	Quintile 4 (N=330)	Quintile 5 (N=250)	P-value
DNA TTAC	No	322 (96%)	617 (97%)	429 (98%)	319 (97%)	247 (99%)	0.10
appointment	Yes	15 (5%)	21 (3%)	8 (2%)	11 (3%)	3 (1%)	
TTAC to	No	285 (85%)	512 (80%)	377 (86%)	289 (88%)	217 (87%)	**0.01**
BFB	Yes	52 (15%)	126 (20%)	60 (14%)	41 (12%)	33 (13%)	
TTAC to	No	318 (94%)	618 (97%)	420 (96%)	323 (98%)	240 (96%)	0.16
Cons clinic	Yes	19 (6%)	20 (3%)	17 (4%)	7 (2%)	10 (4%)	
TTAC to	No	96 (28%)	190 (30%)	99 (23%)	70 (21%)	46 (18%)	**0.001**
test	Yes	241 (72%)	448 (70%)	338 (77%)	260 (79%)	204 (82%)	

Table 8-Assessment / clinic outcomes by level of deprivation (part 2)

Outcome	Category	Quintile 1 (N=337)	Quintile 2 (N=638)	Quintile 3 (N=437)	Quintile 4 (N=330)	Quintile 5 (N=250)	P-value
Diagnostic tests	No	95 (28%)	191 (30%)	92 (21%)	69 (21%)	44 (18%)	**<0.001**
	Yes	242 (72%)	447 (70%)	345 (79%)	261 (79%)	206 (82%)	
Discussed in MDM	No	94 (28%)	182 (29%)	87 (20%)	66 (20%)	40 (16%)	**<0.001**
	Yes	243 (72%)	456 (71%)	350 (80%)	264 (80%)	210 (84%)	
Biofeedback	No	73 (22%)	121 (19%)	85 (19%)	62 (19%)	40 (16%)	0.55
	Yes	264 (78%)	517 (81%)	352 (81%)	268 (81%)	210 (84%)	
Biofeed appoint-ments	-	3 [1, 5]	3 [1, 5]	3 [1, 5]	3 [2, 6]	3 [2, 6]	0.33
Seen consultant	No	231 (69%)	451 (71%)	288 (66%)	220 (67%)	148 (59%)	**0.02**
	Yes	106 (31%)	187 (29%)	149 (34%)	110 (33%)	102 (41%)	
Surgical procedure	No	298 (88%)	580 (91%)	390 (89%)	282 (86%)	209 (84%)	**0.02**
	Yes	39 (12%)	58 (9%)	47 (11%)	45 (14%)	41 (16%)	
Treatment outcome	Discharged to GP	187 (55%)	358 (56%)	256 (59%)	212 (64%)	164 (66%)	0.06
	DNA / discharged	140 (42%)	262 (41%)	165 (38%)	113 (34%)	78 (31%)	
	Ongoing	10 (3%)	18 (3%)	16 (4%)	5 (2%)	8 (3%)	

CHAPTER 5 - DISCUSSION

The analysis examined whether there were disparities in PFD treatment and diagnosis in ethnical minorities referred to a tertiary referral center for PFD in London between 2013 and 2018. Moreover, the presence of inequalities in management of PFD in patients belonging to different levels of Socioeconomic Status has been evaluated.

We considered a database of 2001 patients, however we had to exclude 875 patients for the first part of the analysis due to incomplete data about race. Collection of data about ethnicity is not always adequate in research. [45] This is an important aspect cause the lack of representation of minorities in trials results in the loss of a slice of the population and does not reflect the heterogeneity that we find in the real population.

We found that main complaint varied significantly across the ethnic groups; constipation was the commonest. Anal incontinence (AI) was more frequent in Asian patients, anal pain was more common in the Black-Other group, mixed (ODS/constipation and AI) presentation was more frequent in the Other ethnic group, middle compartment prolapse was more frequent in the White-Other group while rectal prolapse was more frequent in White-British and Asian groups.

Boyd et al. in their review [5] found no association between race and faecal incontinence prevalence. Our result can be explained by the fact that anal incontinence in reality includes faecal incontinence and consequently it is easy to underline differences simply because it's a larger group.

Data related to middle compartment prolapse (includes prolapse of the anterior and posterior vaginal wall and prolapse of the vaginal vault) seems to agree to other findings in literature. For example, Whitcomb et al. found that symptomatic prolapse presents differently in various ethnicities with a higher prevalence in White Women and in the Latina group. [46]

Significant differences between ethnic groups in seeing a consultant and undergoing a surgical procedure ($p=0.001$, $p=0.002$) have been found. The White British and Asian groups were most likely to be seen by a consultant and to undergo a surgical procedure and Black British and Black Other groups were least likely.

This is in part consistent with other studies in the literature related to disparity in treatments of urogynaecological PFD in minorities. Shah A.D. et al. analyzed 199.698 women with

pelvic organ prolapse who had surgery in the United States, and they found that 67.6% of surgeries were performed in White women while just the 3.8% were performed in Black women. [47]

In our study, patients with PFD were first assessed in a telephone assessment triage consultation (TTAC). We found that ethnic groups differed significant in terms of not attending appointments (DNA) of the TTAC. DNA was most common in minorities groups such as Other ethnic group and the Mixed group. This result allows us to introduce an important issue in health care: the seeking for care behaviour is not similar in all patients.

Reasons behind this might be related to economic factors such as the ability to take time off work, access to care, childcare and family organization, culture, linguistic barriers, bother of symptoms, temporary accommodations, education and knowledge of the diseases.

One possible explanation of the higher rate of DNA in patients belonging to minorities could be the different level of bother of the disease. It has been previously demonstrated that level of bother differs in people with different ethnicity. For example, Dunivan et al. observed a different level of bother and gravity of symptoms in Hispanic, native American and Non-Hispanic patients with Hispanic and native American patients more bothered than the non-Hispanic group. [48]

Another key aspect could be the level of education and knowledge of the disease. The level of education can influence the seeking for care behaviour: if patients are not aware of their conditions and of the existence of effective treatments for it, they tend to live with their condition or consider it as part of the normal aging process.

Fante et al. [49] investigated the knowledge of PFD in women of different ethnic groups in a systematic analysis. They found that, in almost all the studies, women's knowledge of the pelvic floor, was poor and most of them had never received information about it and this got worse in women of underrepresented minorities. Roa L. et al. assessed the knowledge status of PFD in immigrant women in Canada and compared it to Canadian-born women. To assess the knowledge of the women they used the Prolapse and Incontinence Knowledge Questionnaire (PIKQ), and they found that immigrant women performed worse than Canadian women. In addition, they repeated the analysis by dividing the group of immigrants based on the length of

time they lived in Canada: those who had lived for less than ten years performed worse than those that had lived there more than ten years. [50]

Care seeking behaviors demand that the patient be their own advocate; this will also be affected by factors such as the Socioeconomic Status (SES).

It can be determined by considering many factors such as level of education, house income and level of deprivation of the area where people live. In this study the level of deprivation of the home location calculated with the IMD has been considered an indicator of the SES.

We found that White British and Asian patients were most likely to be in the upper quintiles, suggesting least deprivation and no patients of Black Other group and Black British group were present in these quintiles. On the other hand, in the first quintile Black Other patients, Black Caribbean and Mixed patients were more present.

This suggests that minorities patients live in more deprived areas.

According to our results it seems that patients who lived in more deprived areas were less tested when compared to patients from the highest quintiles and were treated more often conservatively.

Confirming what has been said, we have actually found that patients belonging to the two lowest quintiles were less investigated with diagnostic tests, were less discussed in an MDM, were less reviewed by a consultant and were less likely to undergo surgery.

In addition, patients with a lower SES were more likely to be lost on follow up appointments while patients of the higher quintiles (higher SES) were more likely to be discharge to General Practitioner (GP). In order words, patients with a higher SES terminated the cycle of care for the condition more frequently than minorities patients living in deprived areas.

As a result, this study allows to say that SES may be one determinant of the seeking for care behaviour.

CHAPTER 6 - CONCLUSION

This analysis has highlighted the existence of disparities in treatment of minorities patients in terms of consultant review and surgical procedures performed. Moreover, this study has raised to attention the importance of engagement of ethnic minorities in the care process as too many patients are still lost on follow up. The influence of SES on patient care has been demonstrated and this really is a noteworthy result when found in a setting such as the NHS where equitable care should be achievable for everyone. This introduces other factors that may be involved in determining the success of patients care. These patients are not always able to advocate for themselves and so we have responsibility to ensure the provision of equitable healthcare by breaking down barriers to allow care seeking behavior and engagement in services.

It has been identified where patients are more likely to be disadvantaged in the care service they receive due to their race; minorities are still suffering from disparity in health care.

Of course, this can be related to many factors, some of them, such as SES and level of education, have been examined in this study but there could be other more causes of that, even the more intangible ones as implicit bias, structural racism and prejudice in health care.

Future works should involve the routine inclusion of ethnicity and socioeconomic status data collection during research, further exploration of the factors which prevent care seeing behaviour in ethnic minorities and those in lower socioeconomic groups and a better understanding of why different ethnicities may present with differing symptoms.

This study allows for replication of service provision frameworks in other affected areas to minimise inequalities in health care.

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