

Analysis of the epidemiological profile of patients actively registered in the ostomy care service in Juiz de Fora

Análise do perfil epidemiológico dos pacientes cadastrados ativamente no serviço de ostomias de Juiz de Fora

DOI:10.34117/bjdv7n3-649

Recebimento dos originais: 08/02/2021

Aceitação para publicação: 25/03/2021

João Vicente Linhares Rodrigues

Coloproctologist and Lecturer at the Medical School of the Faculty of Medical and Health Sciences of Juiz de Fora - Suprema
.Alameda Salvaterra, 200 - Salvaterra, Juiz de Fora - MG, 36033-003
E-mail: jvlrprocto@gmail.com

Amanda Pereira Lima

Coloproctology Resident Physician at Campinas State University - Unicamp
Cidade Universitária Zeferino Vaz - Barão Geraldo, Campinas - SP, 13083-970
E-mail: amandapl.md@gmail.com

Bruna dos Santos Rocha Schiavon

Medical Student at the Faculty of Medical and Health Sciences of Juiz de Fora - Suprema
Alameda Salvaterra, 200 - Salvaterra, Juiz de Fora - MG, 36033-003
E-mail: brunaschiavon@hotmail.com

Tayenne do Vale Cabral

Pediatrics Resident Physician at Clinical Hospital of Federal University of Triângulo Mineiro - HC-UFTM
Avenida Getúlio Guaritá, 130 - Nossa Senhora da Abadia, Uberaba - MG, 38025-440
E-mail: tayenne.v.cabral@gmail.com

Yara Cristina Niquini de Lima

Gynecology and Obstetrics Resident Physician at Regional Hospital Doctor João Penido
Avenida Juiz de Fora, 2555 - Grama, Juiz de Fora - MG, 36048-000
E-mail: yara17lima@gmail.com

Daniela Girardi Pereira Linhares Rodrigues

Medical Student at the Faculty of Medical and Health Sciences of Juiz de Fora - Suprema
Alameda Salvaterra, 200 - Salvaterra, Juiz de Fora - MG, 36033-003
E-mail: danigplr01@gmail.com

ABSTRACT

AIM: Population-based study on the profile of ostomized patients attended by a specialized service in the city of Juiz de Fora, Brazil. METHOD: This retrospective, cross-sectional study was based on a descriptive epidemiological model. A total of 2,406 medical records of patients registered between 1988 and 2016 were analyzed and only the records of active patients (alive, not having undergone reconstruction) were selected (507 cases). The analyzed variables were gender, age, type of stoma, and the disease that led to the need for

a stoma. Statistical analyzes were performed using SPSS software, version 20.0. RESULTS: Stomata were observed in 265 male patients (52.3% of the cases). The age varied from a range of 0 to 98 years. The colostomy corresponded to 63.7% of the cases. Ileostomy was the second most common type of stoma (27%) and then the urostomy (6.5%) was the third. The main causes for stoma creation were colorectal cancer (CRC) with 59.8% of cases, bladder cancer (5.9%) and others less prevalent, such as intestinal obstruction, diverticular disease, volvulus, peritonitis, colorectal injury, and inflammatory bowel disease. CONCLUSION: Colostomy was the most frequent type and the highest prevalence of stomata that was observed in males. The age group of the most ostomized patients was between the fourth and eighth decade. CRC was the main cause of a diverting stoma creation. The services of ostomized care with competent and efficient multidisciplinary teams play an important role for the user can overcome the possible limitations of an intestinal or urinary stoma.

Keywords: Colostomy, Ileostomy, Intestinal Stomas, Ostomized, Urostomy.

RESUMO

OBJETIVO: Estudo de base populacional sobre o perfil dos estomizados atendidos em serviço especializado da cidade de Juiz de Fora, Brasil. **MÉTODO:** Estudo retrospectivo, transversal, baseado em modelo epidemiológico descritivo. Foram analisados 2.406 prontuários de pacientes cadastrados entre 1988 e 2016 e selecionados apenas os prontuários de pacientes ativos (vivos, não reconstruídos) (507 casos). As variáveis analisadas foram sexo, idade, tipo de estoma e a doença que levou à necessidade de estoma. As análises estatísticas foram realizadas no software SPSS, versão 20.0. **RESULTADOS:** Os estômatos foram observados em 265 pacientes do sexo masculino (52,3% dos casos). A idade variou de 0 a 98 anos. A colostomia correspondeu a 63,7% dos casos. Ileostomia foi o segundo tipo de estoma mais comum (27%) e a urostomia (6,5%) foi o terceiro. As principais causas de criação de estomas foram câncer colorretal (CCR) com 59,8% dos casos, câncer de bexiga (5,9%) e outros menos prevalentes, como obstrução intestinal, doença diverticular, volvo, peritonite, lesão colorretal e doença inflamatória intestinal. **CONCLUSÃO:** A colostomia foi o tipo mais frequente e a maior prevalência de estômatos observada no sexo masculino. A faixa etária dos pacientes mais estomizados situou-se entre a quarta e a oitava década. CRC foi a principal causa de uma criação de estoma de desvio. Os serviços de atendimento ao estomizado com equipes multiprofissionais competentes e eficientes desempenham um papel importante para que o usuário possa superar as possíveis limitações de um estoma intestinal ou urinário.

Palavras-chave: Colostomia, Ileostomia, Estomas intestinalis, Ostomizado, Urostomia.

1 INTRODUCTION

The exteriorization of any hollow viscera through the body is called a stoma (Gonzalez et al., 2011). Stomas have several functions, including ventilation (Marsico and Marsico, 2010), nutrition (Anselmo et al., 2013), and elimination of secretions from the urinary and gastrointestinal systems (Daluvoy et al., 2008; and Neto et al., 2016). The most common intestinal stomas are created via colostomy and ileostomy (Robertson et al., 2005; Shabbir and Britton, 2010; Kwiatt and Kawatta, 2013; and Salome et al., 2017). Stomas may be created using both elective and emergency procedures (Santos et al., 2007; and

Kwiatt and Kawatta, 2013). They are classified as temporary or permanent and are described according to the affected organ (Meirelles and Ferraz, 2001; Arumugam et al., 2002; and Lim et al., 2013). A stoma may be created using either laparotomy or laparoscopy (Gonzalez et al., 2011).

The construction of an intestinal stoma, although not technically difficult, requires sound knowledge of anatomy to avoid both early (necrosis, retraction, bleeding, dermatitis, and edema) and late complications (stenosis, prolapse, granuloma, and parastomal hernia). These complications require additional surgical interventions (Mala and Nesbakken, 2008; and Kwiatt and Kawatta, 2013), which further increase procedure-related morbidity (Cruz et al., 2008; Formijne Jonkers et al., 2012; and Sheetz et al., 2014). Cases of systemic complications, such as water-electrolyte disorder, dehydration, renal failure, and even death, have been described (Thalheimer et al., 2006; Mala and Nesbakken, 2008; and Sheetz et al., 2014).

It is estimated that there are approximately 50,000 individuals with a stoma in Brazil (Gemelli and Zago, 2002). In the United States, more than 100,000 stomas are created every year (Sheetz et al., 2014; and Gunnels Jr. et al., 2017).

A stoma causes changes in the physiology, self-esteem, and body image of the patient, there by contributing to a significant deterioration in the quality of life (Vonk-Klaassen et al., 2016; Silva et al., 2021; and Salome et al., 2017). To minimize this effect, follow-up by specialized professionals and a multidisciplinary team is extremely important (Gemelli and Zago, 2002; and Silva et al., 2021).

Considering the large number of ostomy patients, the high rates of morbidity and mortality associated with the creation of a stoma, and the scarcity of studies conducted in Brazil on this topic, it has become relevant to conduct a population-based study on the profile of the patients actively registered in the Ostomy Association of Juiz de Fora (Minas Gerais).

2 METHOD

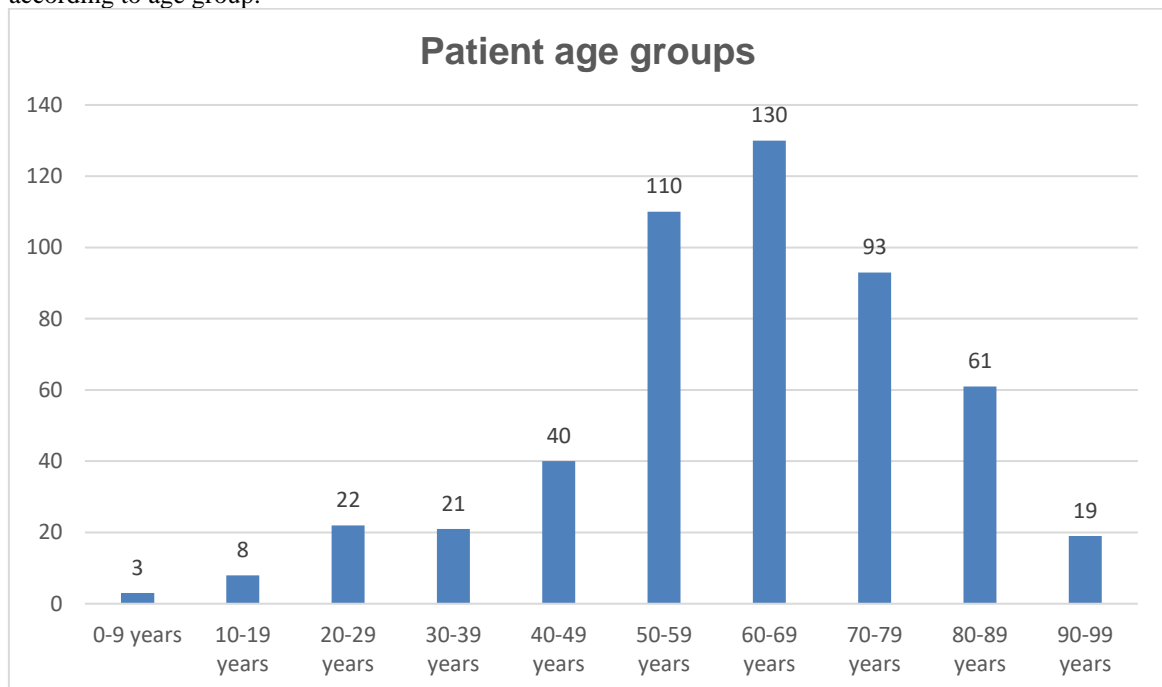
This retrospective, cross-sectional study was based on a descriptive epidemiological model and conducted at the Ostomy Association in Juiz de Fora. After approval by the Research Ethics Committee, 2,406 medical records of patients registered between 1988 and 2016 were analyzed. Of these, only the records of active patients (alive, not having undergone reconstruction) were selected for a total of 507 individuals. The analyzed variables were sex, age (stratified by age group), type of stoma, and the disease

that led to the need for a stoma (based on the ICD-10). Statistical analysis was performed using SPSS software, version 20.0.

3 RESULTS

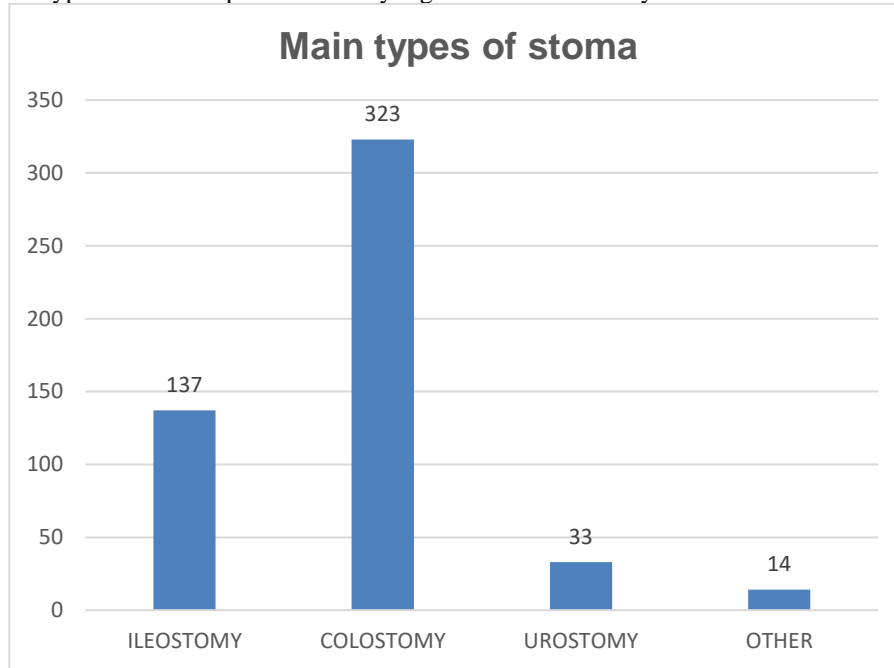
Of the 2,406 registered patients, 507 were active patients in the Ostomy Association in Juiz de Fora in 2016. Most (74%) were from Juiz de Fora and the remaining were from 35 different municipalities. The male sex was more prevalent (n=265, 52.3%) and the mean age was 55.5 years (range = 0–98 years, SD= 18.873). The distribution of patients according to age group is shown in Graph 1.

Graph 1: Distribution of patients actively registered in the Ostomy Association in Juiz de Fora in 2016 according to age group.



With regard to type of stoma created, colostomy was performed in 323 patients, corresponding to 63.7% of cases. Lower left quadrant colostomy was performed in 210 patients, end colostomy in 274 patients, and temporary colostomy in 167 patients. Ileostomy was the second most common type of stoma (137 patients, or 27% of cases). Most ileostomies were loop ileostomies (n=72), of a temporary nature (n=111), and in the lower right quadrant (n=105). The third most common stoma type was urostomy (33 patients, or 6.5% of cases). Less frequent types, such as mucous and biliary fistulas, were also identified. Below is a graph showing the main stoma types.

Graph 2: Main types of stoma patients actively registered in the Ostomy Association in Juiz de Fora in 2016.



Among the causes for stoma creation, colorectal cancer (CRC) was the most common (303 patients, or 59.8% of cases), with the rectum being the most frequent location (204 patients), followed by the left colon (splenic flexure, descending colon, sigmoid colon, and rectosigmoid junction) in 79 cases. Bladder cancer was the main cause of urostomy creation in 30 patients (5.9% of cases). Other indications were diverticular disease, colorectal injury, inflammatory bowel disease, volvulus, peritonitis, intestinal obstruction, and anal cancer. The main causes are shown in Table 1.

Table 1: Main causes of stoma creation, according to the ICD-10, among patients actively registered in the Ostomy Association in Juiz de Fora in 2016.

Cause	ICD	Number of cases
MALIGNANT NEOPLASM OF THE RECTUM	C20	204
MALIGNANT NEOPLASM OF THE RECTOSIGMOID JUNCTION	C19	37
MALIGNANT NEOPLASM OF THE SIGMOID COLON	C18.7	31
MALIGNANT NEOPLASM OF THE BLADDER	C67	27
OTHER IMPACTIONS OF THE INTESTINE	K56.4	22
VOLVULUS	K56.2	17
DIVERTICULITIS OF THE LARGE INTESTINE	K57.2	15
PERITONITIS	K65	14
INJURY OF THE COLON	S36.5	11
MALIGNANT NEOPLASM OF THE ASCENDING COLON	C18.2	10
MALIGNANT NEOPLASM OF THE DESCENDING COLON	C18.6	7
RECTOVAGINAL FISTULA	N82.3	7
MALIGNANT NEOPLASM OF THE TRANSVERSE COLON	C18.4	6
ULCERATIVE COLITIS	K51	5

MALIGNANT NEOPLASM OF THE SPLENIC FLEXURE	C18.5	4
MALIGNANT NEOPLASM OF THE ANUS AND ANAL CANAL	C21	4
INVASIVE LESION OF THE DIGESTIVE SYSTEM	K26.8	4
CROHN'S DISEASE	K50	4
VASCULAR DISORDERS OF THE INTESTINE	K55	4
RECTUM INJURY	S36.6	4
POSTOP DISORDERS OF THE DIGESTIVE SYSTEM	K91.9	4
MEGACOLON	K93.1	4
Other	-	62

4 DISCUSSION

Stoma creation, although a relatively simple surgical technique, should be performed according to basic criteria and with adequate planning in order to avoid the occurrence of early or late complications (Shabbir and Britton, 2010). Preoperative marking of the stoma site, passage of the intestinal loop through the rectus abdominis muscle without traction or tension and with adequate vascularization, and anatomical, physiological, and surgical knowledge are fundamental factors for the success of the procedure (Meirelles and Ferraz, 2001; Santos et al., 2007; Cruz et al., 2008; Gonzalez et al., 2011). Although these protocols are widely established in hospital surgical units, they are often disregarded, especially in emergency situations or when performed by less experienced surgeons (Pearl et al., 1985; Arumugam et al., 2002; Cruz et al., 2008; and Shabbir and Britton, 2010). Patient-related factors such as advanced age, high body mass index (BMI), previous surgeries, exposure to radiotherapy, diabetes, use of corticosteroids, smoking, and malnutrition are the main causes of complications (Kwiatt and Kawatta, 2013).

Complications of stoma creation occur in 10-80% of patients, according to several studies (Pearl et al., 1985; Arumugam et al., 2002; Robertson et al., 2005; Shabbir and Britton, 2010; Formijne Jonkers et al., 2012; Sier et al., 2015). Complications are classified as early, if they occur in the first 30 days after the operation, or as late complications (Kwiatt and Kawatta, 2013). The most common early complication is peristomal dermatitis (Pearl et al., 1985; Robertson et al., 2005; Santos et al., 2007; Persson et al., 2009; Formijne Jonkers et al., 2012), which occurs more frequently in patients with an ileostomy (Santos et al., 2007; and Persson et al., 2009). A stoma that is not properly constructed leads to longer hospital stays, exorbitant health system costs, and a significant deterioration in quality of life (Salvadarena, 2013; and Sheetz et al., 2014).

This study showed that stomas were more frequent in males (265 cases, or 52.3%), which is consistent with a study by Pearl et al. (1985), in which 390 of the 670 patients (58.2%) with a stoma analyzed over a period of six years were men. Gastinger et al. (2005) assessed 881 patients with intestinal diversion after anterior resection due to low rectal cancer and reported that most patients were men (554 cases, or 62.9%). Thalheimer et al. (2006) studied 120 patients with CRC subjected to ileostomy closure and observed that these stomas were predominantly created in men (88 cases, or 73.3%). In a retrospective study, Von Bahten et al. (2006) analyzed 42 medical records of candidates for intestinal reconstruction and found a marked predominance of men (34 cases, or 80.9%). Santos et al. (2007) described a predominance of male patients (101 cases, or 56.7%) among 178 ostomates. Mala and Nesbakken (2008) evaluated 72 protective stomas for colorectal and coloanal anastomosis and identified 40 male cases (56%). Persson et al. (2009) conducted a study with 180 patients who underwent elective stoma creation and showed that 109 (60.6%) were men. Silva et al. (2010) presented a study involving 29 patients with Hartmann's colostomy who were candidates for intestinal reconstruction and identified 16 male cases (55.2%). Shiomi et al. (2011) reported a male predominance among 222 patients submitted to protective stoma creation after low anterior resection for rectal cancer (144 patients or 64.9%). Altuntas et al. (2012) monitored a group of 72 patients with colostomy, ileostomy, and urostomy and observed that 44 were men (61.1%). Lim et al. (2013) published a study with 895 ostomates after low anterior resection and total excision of the mesorectum in which men accounted for the majority of cases (596 cases, or 66.6%). In the study by Sheetz et al. (2014), a slight predominance of men (50.2%) was observed among 4,250 candidates for intestinal diversion in 34 hospitals between 2006 and 2011. Banaszkiwicz et al. (2015) analyzed 443 patients with CRC who underwent stoma construction and reported that most were men (240 cases, or 54.2%). Sier et al. (2015) demonstrated that among 359 ileostomy patients who were candidates for reconstruction, 207 were men (57.7%). A study conducted by Neto et al. (2016) which included 216 ostomy patients identified a slight male predominance (109 cases, or 50.5%). Gunnels Jr. et al. (2017) studied a group of 770 patients with intestinal diversion, of which 396 were men (51.4%). Conversely, in studies by Daluvoy et al. (2008), Formijne Jonkers et al. (2012), and Salome et al. (2017), cases of male ostomy patients were less frequent (48.9%, 48%, and 40.9%, respectively).

With regard to age, until 2016 the Ostomy Association in Juiz de Fora assisted patients aged between 0 and 98 years (mean 55.5 years). The predominant age group was

that between 50 and 89 years, which included a total of 394 patients (77.7%). The studies by Santos et al. (2007), Daluvoy et al.(2008), Silva et al. (2010), Altuntas et al. (2012), Neto et al. (2016), and Gunnels Jr. et al. (2017) showed similar age statistics. Reports by Arumugam et al. (2002), Gastinger et al. (2005), Thalheimer et al.(2006), Mala and Nesbakken, (2008), Shiomi et al. (2011), Formijne Jonkers et al. (2012), Sheetz et al. (2014), and Sier et al. (2015) demonstrated that the mean age of patients with a stoma was approximately 65 years. A closer examination of these data indicates that the mean age was higher in these studies because they did not include cases of abdominal trauma, which is very common in younger individuals, and their inclusion would have considerably reduced the mean age. Only the report by Sier et al. (2015), who analyzed 359 patients subjected to closure of end or loop ileostomy, mentions trauma as one of the causes of stoma construction. The mean age of the sample in the present study was slightly lower than in most studies. This is probably due to the inclusion of younger patients with inflammatory bowel disease and trauma (perforation by firearm or knife, blunt abdominal trauma, and perineal trauma).Trauma is strongly associated with emergency hospital visits and, unfortunately, is very common in large cities. The study by Von Bahten et al. (2006) confirms this affirmation. In it, the mean age of ostomy patients was lower (42 years) and trauma was the main indication for stoma creation (in approximately half of the cases).

Colostomy and ileostomy are the most frequently performed intestinal stomas (Robertson et al., 2005; Shabbir and Britton, 2010; and Kwiatt and Kawatta, 2013). In the present study, 460 cases of intestinal diversion were identified. There was a predominance of colostomy (323 cases, of which 274 were end colostomies and 49 were loop colostomies). Ileostomy was performed in 137 patients (62 were end ileostomies, 73 were loop ileostomies, and two cases were unspecified). These data are in line with several other studies. Pearl et al. (1985) published a retrospective study of 610 stomas created consecutively, of which 350 were colostomies (88 end and 262 loop colostomies) and only 16 were ileostomies (10 end and six loop ileostomies).Arumugam et al. (2002) conducted a prospective study to assess 97 patients who underwent stoma construction during a period of eight months and reported 56 colostomies (39 end and 17 loop colostomies) and 41 ileostomies (22 end and 19 loop ileostomies). Santos et al. (2007) analyzed 178 medical records of patients enrolled in an ostomate care program and reported 152 colostomies (104 end and 48 loop colostomies) and only 21 ileostomies (16 end and five loop ileostomies). Cruz et al. (2008) published a review of 276stomas created in individuals with CRC and found 225 colostomies (181 end and 44 loop colostomies) and 42 ileostomies (nine end

and 33 loop ileostomies), in addition to some cases of mucous fistula. Another study in which there was a large predominance of colostomy cases was that by Daluvoy et al. (2008) who assessed 96 patients. Of these, 69 had end colostomies, whereas 27 had ileostomies (two end and 25 loop ileostomies). Persson et al. (2009) analyzed 180 patients who underwent elective stoma creation and found 122 end colostomies and 58 ileostomies (20 end and 38 loop ileostomies). A prospective study by Formijne Jonkers et al. (2012) looked at 100 ostomy patients and reported 81 colostomies (36 end and 45 loop colostomies), and only 19 ileostomies (seven end and 12 loop ileostomies). Neto et al. (2016) published a study with a sample of 216 patients treated at two ostomy reference centers and reported that colostomy was more frequent (193 cases), with ileostomy occurring in only 23 patients. Salome et al. (2017) observed 36 colostomies among 44 patients followed at a stoma therapy center.

However, some studies showed the predominance of ileostomy over colostomy. Rullier et al. (2001) identified 167 rectal cancer patients subjected to protective stoma creation for anastomosis and observed 107 loop ileostomies and 60 loop colostomies. In a randomized clinical trial, Law et al. (2002) described 80 patients who underwent surgery for mid or distal rectal cancer. In these patients, protective loop stomas for anastomosis consisted of 42 ileostomies and 38 colostomies. In a prospective study, Robertson et al. (2005) analyzed 408 patients who underwent elective or emergency stoma creation and reported 213 ileostomies vs. 195 colostomies. Later, Altuntas et al. (2012) assessed 72 ostomy patients, in who ileostomies made up 51 of the cases, whereas only 18 colostomies were recorded. Salvadalena (2013) published a prospective study with 47 patients who were followed up for three months after stoma creation. Among these patients, 37 ileostomies and only eight colostomies were observed. In a meta-analysis involving five studies, Geng et al. (2015) reported 1,025 patients with intestinal diversion (652 loop ileostomies and 373 loop colostomies). Gunnels Jr. et al. (2017) reported 548 ileostomies and 212 colostomies in 770 ostomy patients.

It is important to note that the first ileostomies were performed almost one hundred years after the first colostomy (Meirelles and Ferraz, 2001). Until the 1950s, ileostomies were less used because of high complication rates. Ileostomy results improved when new surgical techniques of ileal mucosa eversion were introduced by Turnbull in Cleveland and by Brooke in London, thus providing patients with a better quality of life (Meirelles and Ferraz, 2001). Some surgery centers have recently made loop ileostomy the standard procedure for anastomosis protection in patients with rectal cancer (ease of construction,

low rates of complications, and less need for reoperation). In fact, these afore mentioned studies published in the last 15 years show a greater use of ileostomy in colorectal surgical procedures. However, few studies actually demonstrate which is the best type of intestinal diversion because factors such as patient heterogeneity, colorectal disease complexity, surgeon experience, and type of procedure (elective or emergency) all hinder a more reliable analysis. The observed differences with regard to stoma type are mostly associated with the surgical technique chosen and most frequently used by the surgeon, hospital surgical standards and protocols, and the disease that led to stoma creation.

The majority of stomas are constructed as a result of trauma or malignant and benign diseases, in particular diverticular colonic disease, intestinal obstruction, megacolon, anal incontinence, volvulus, congenital anomalies, familial adenomatous polyposis, inflammatory bowel disease, and CRC (Arumugam et al., 2002; Santos et al., 2007; Daluvoy et al., 2008; Persson et al., 2009; Gonzalez et al., 2011; Formijne Jonkers et al., 2012; Salvadalena, 2013; Sheetz et al., 2014; Neto et al., 2016; Gunnels Jr. et al., 2017).

CRC is the third most common cancer worldwide. For this reason, CRC represents a major public health concern (Vonk-Klaassen et al., 2016; and Inadomi, 2017). In Brazil, new cases of CRC are estimated at 35,000/year (INCA, 2015). Surgery is the most common treatment for this disease, with 10% of cases having permanent colostomy as an outcome (Vonk-Klaassen et al., 2016) due to the progression of the underlying disease, patient reluctance to undergo a new surgical procedure, or the technical impossibility of performing anastomosis (Banaszkiewicz et al., 2015).

The results of the present study showed that the majority of the created stomas (303 cases, or 59.8%) were due to CRC, which is in line with other review articles. Arumugam et al. (2002) demonstrated that out of 97 ostomy patients who were followed up for one year, 49 (50.5%) were operated on for CRC. In 2007, Santos et al. observed that 102 patients (57.3%) of a total of 178 had stomas created due to cancer. In a prospective study of 180 patients subjected to a two-year post-operative follow-up for intestinal diversion, Persson et al. (2009) reported that 129 stomas (71.7%) were created due to CRC. Altuntas et al. (2012) monitored 72 ostomy patients in a specialized center and reported that CRC was the major cause of stoma construction (68 cases, or 94.4%). In a one-year prospective study of 100 patients with stomas, Formijne Jonkers et al. (2012) observed that CRC was the indication for 46 cases (46%). Later, Sier et al. (2015) studied 359 patients with intestinal diversion and found that malignant diseases were the most common indication

(217 cases, or 60.4%). In a study which included two stoma therapy centers, Neto et al. (2016) established that CRC was the most prevalent disease (112 cases, or 51.8%) in a group of 216 ostomates. Salome et al.(2017) reported that cancer was the most common stoma indication (33 cases, or 75%) in a study which included 44 patients with a stoma.

Despite recent advances insurgical techniques, there is still a significant number of ostomy patients in this region of Brazil. Many patients have psychological problems (feelings of mutilation and rejection) that have major repercussions on their quality of life and negative effects on family and professional relationships. Institutions and multidisciplinary teams with highly qualified professionals that give support to ostomy patients are extremely important in helping them overcome potential limitations and return to their normal activities.

5 CONCLUSION

Colostomy was the most frequent type and the highest prevalence of stomata that was observed in males. The age group of the most ostomized patients was between the fourth and eight decade. CRC was the main cause of a diverting stoma creation. We conclude that patients living with an intestinal or urinary stoma require an adequate support structure in this very difficult period of their lives. Ostomy associations and multidisciplinary teams play an important role in this context.

REFERENCES

- ALTUNTAS YE et al. The role of group education on quality of life in patients with a stoma. *European Journal of Cancer Care* 2012. DOI: 10.1111/j.1365-2354.2012.01360.x. Acesso em 28/05/2016.
- ANSELMO CB et al. Surgical gastrostomy: current indications and complications in a university hospital. *Rev Col Bras Cir* 2013;40(6):458-462.
- ARUMUGAM PJ et al. A prospective audit of stomas-analysis of risk factors and complications and their management. *Colorectal Disease* 2002;5:49-52.
- BANASZKIEWICZ Z et al. Intestinal stoma in patients with colorectal cancer from the perspective of 20-year period of clinical observation. *Prz Gastroenterol* 2015;10(1):23-27.
- CRUZ GMG et al. Complicações dos Estomas em Câncer Colorretal: Revisão de 21 Complicações em 276 Estomas Realizados em 870 Pacientes Portadores de Câncer Colorretal. *Rev Bras Coloproct* 2008;28(1): 050-061.
- DALUVOY S et al. Factors associated with ostomy reversal. *Surg Endosc* 2008; 22:2168-2170.
- FORMIJNE JONKERS HA et al. Early complications after stoma formation:a prospective cohort study in 100 patientswith 1-year follow-up. *Int J Colorectal Dis* 2012;27:1095-1099.
- GASTINGER I et al. Protective defunctioning stoma in low anterior resection for rectal carcinoma. *Br J Surg* 2005;92:1137-1142.
- GEMELLI LMG & ZAGO MMF. A interpretação do cuidado com o oostomizado na visão do enfermeiro: um estudo de caso. *Rev Latino-am Enfermagem* 2002; 10(1):34-40.
- GENG HZ et al. Meta-analysis of elective surgical complications related to defunctioning loop ileostomy compared with loop colostomy after low anterior resection for rectal carcinoma. *Ann R Coll Surg Engl* 2015;97:494-501.
- GONZALEZ HGM et al. Estomasintestinales: construcción y complicaciones. *An Med (Mex)* 2011;56(4):205-209.
- GUNNELLS Jr DJ et al. Racial Disparities After Stoma Construction Exist in Time to Closure After 1 Year but Not in Overall Stoma Reversal Rates. *J Gastrointest Surg* 2017. DOI 10.1007/s11605-017-3514-y.
- INADOMI JM. Screening for colorectal neoplasia. *N Engl J Med* 2017;376:149-56.
- INCA. Câncer colorretal 2015. <http://www2.inca.gov.br>. Acesso em 23/09/2017.
- KWIATT M & KAWATTA M. Avoidance and Management of Stomal Complications. *Clin Colon Rectal Surg* 2013;26:112-121.

LAW WL; CHU KW; CHOI HK. Randomized clinical trial comparing loop ileostomy and loop transverse colostomy for faecal diversion following total mesorectal excision. *Br J Surg* 2002;89:704-708.

LIM SW et al. Risk factors for permanent stoma after low anterior resection for rectal cancer. *Langenbecks Arch Surg* 2013;398:259–264.

MALA T & NESBAKKEN A. Morbidity related to the use of a protective stoma in anterior resection for rectal cancer. *Colorectal Dis* 2008;10:785–788.

MARSICO PS & MARSICO GA. Traqueostomia. *Pulmão RJ* 2010;19(1-2):24-32.

MEIRELLES CA & FERRAZ CA. Estudo teórico da demarcação do estoma intestinal. *Rev Vers Enferm* 2001;54(3):500-510.

NETOMAFL;FERNANDES DOA;DIDONÉEL. Epidemiological characterization of ostomized patients attended in referral Center from the city of Maceió, Alagoas, Brazil. *J Coloproctol* 2016;36(2):64–68.

PEARL et al. Early local complications for intestinal stoma. *Arch Surg* 1985;120:1145-1147.

PERSSON E et al. Stoma-related complications and stoma size – a 2-year follow up. *Colorectal Dis* 2009;12:971–976.

ROBERTSON I et al. Prospective analysis of stoma-related complications. *Colorectal Dis* 2005;7;279–285.

RULLIER E et al. Loop Ileostomy versus Loop Colostomy for Defunctioning Low Anastomoses during Rectal Cancer Surgery. *World J Surg* 2001;25(3):274-278.

SALOME GM et al. Health locus of control, body image and self-esteem in individuals with intestinal stoma. *J Coloproctol* 2017;37(3):216-224.

SALVADALENA GD. The Incidence of Stoma and Peristomal Complications During the First 3 Months After Ostomy Creation. *J WoundOstomyContinenceNurs* 2013;40(4):400-406.

SANTOS CHM; BEZERRA MM; BEZERRA FMM; PARAGUASSÚ BR. Perfil do Paciente Ostomizado e Complicações Relacionadas ao Estoma. *Rev Bras Coloproct* 2007;27(1): 016-019.

SHABBIR J & BRITTON DC. Stoma complications: a literature overview. *Colorectal Disease* 2010;12:958–964.

SHEETZ KH et al, Complication rates of ostomy surgery are high and vary significantly between hospitals. *Dis Colon Rectum* 2014;57(5):632–637.

SHIOMI A et al. The indications for a diverting stoma in low anterior resection for rectal cancer: a prospective multicentre study of 222 patients from Japanese cancer centers. *Colorectal Disease* 2011;13:1381-1389.

SIER MF et al. Factors affecting timing of closure and non-reversal of temporary ileostomies. *Int J Colorectal Dis* 2015. DOI 10.1007/s00384-015-2253-3.

SILVA CS et al. Primer on intestinal stomach care: customer and companion perception about this educational method. *Braz J Develop* 2021; 7(2): 14225-41.

SILVA RG et al. Reconstrução de trânsito intestinal após confecção de colostomia à Hartmann. *Rev Col Bras Cir* 2010;37(1):017-022.

THALHEIMER A et al. Morbidity of Temporary Loop Ileostomy in Patients With Colorectal Cancer. *Dis Colon Rectum* 2006;49:1011–1017.

VON BAHTEN LC et al. Morbimortalidade da Reconstrução de Trânsito Intestinal Colônica em Hospital Universitário – Análise de 42 Casos. *Rev bras Coloproct* 2006;26(2):123-127.

VONK-KLAASEN SM et al. Ostomy-related problems and their impact on quality of life of colorectal cancer ostomates: a systematic review. *Qual Life Res* 2016;25:125–133.