

PHYSICAL THERAPY COMBINED WITH A LAXATIVE FRUIT DRINK FOR TREATMENT OF CHAGASIC MEGACOLON

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ABSTRACT – *Context* – The treatment of Chagas' disease colopathy is limited to clinical management in the initial of the process, and for patients for whom surgery is not indicated or is not possible, anti-constipation diets are used, along with judicious administration of laxatives and enemas. *Objective* – To evaluate over time the effects of physical-therapy interventions combined with daily ingestion of a laxative fruit drink in the treatment of chagasic megacolon. *Method* – In a quantitative, prospective, and comparative study, 12 patients of both sexes and with a mean age of 67 ± 12 years were clinically evaluated to receive 12 sessions of physical therapy twice a week, along with fruit drink, and were evaluated for intestinal constipation before and after treatment. *Results* – A significant difference ($P < 0.0022$) was observed in the constipation scores before and after 6 weeks of intervention in 91.7% of the patients, and in 72.7% after 12 months, with reduction of laxative medications, softer stools, and increased number of bowel movements. With respect to gender, age, and whether or not the patient had received surgical treatment, there was no significant difference ($P > 0.05$). *Conclusion* – The proposed protocol is easy to implement, safe, non-invasive, and low-cost, with the potential to be deployed in health care by providing benefits independent of gender, age, or whether the participant has undergone surgery, improving the condition of patients with chagasic megacolon.

HEADINGS – Megacolon. Constipation. Chagas disease. Diet. Juices.

INTRODUCTION

Chagas' disease is a tropical disease caused by *Trypanosoma cruzi* that currently affects about 3.5 million Brazilians⁽⁷⁾. The National Survey of 1980 indicated the existence of 166,511 cases in Paraná⁽⁹⁾, and this number is probably underestimated following the migrations of rural populations to urban areas and to the Amazon region in the 1990s.

At present, most individuals are in the chronic stage of the disease and present various clinical forms: indeterminate (50%-69%), cardiac (20%-30%), digestive (10%), and cardio-digestive (8%)⁽²³⁾. The clinical complications cause enormous medical and social losses from early incapacity to work and also death. According to the Ministry of Health⁽⁶⁾, in the period from 1999 to 2007 there were 18,499 hospitalizations, mostly males (53%) older than 40 years (83%), with a cost of US\$ 29,196,684,00.

In the digestive (intestinal) form, the parasite directly affects the myenteric plexus, causing an inflammatory neuropathy followed by neuron degeneration and destruction, which occurs irregularly and with variable

intensity. The final result is the intramural autonomic denervation of the smooth muscle of the intestine, causing atony and consequent dilation of the colon. In Brazil, chagasic megacolon affects 2% to 5% of individuals infected by *T. cruzi*, and predominates in males from 20 to 60 years old⁽¹⁷⁾. A study in 2006⁽⁴⁾ revealed that of 95 patients with Chagas' disease treated at the Regional University Hospital (HUM) in Maringá, PR, Brazil, 41% were affected by the digestive and cardio-digestive forms. The principal complaint of these patients was intestinal constipation, affecting their quality of life^(3,28). The most feared complications in these cases are fecaloma, toxic megacolon, and the occurrence of torsions of the intestinal wall (volvulus) where local circulation may be obstructed, with gangrene and perforation resulting from the ischemia, causing situations of extreme gravity and morbidity⁽⁵⁾. These kinds of clinical complications and the low earning capacity of the patients are a burden on the public-health system⁽³⁴⁾, indicating the need for preventive measures to avoid harm to the patients and optimize costs.

The treatment of chagasic colopathy in the initial stages is restricted to clinical management, and for those

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patients for whom surgery is not indicated or not possible, the use of anticonstipant diets, judicious administration of laxatives that cause colic, flatulence, and abdominal distension, and enemas^(12, 15). In this context, an individually planned and multi-professional holistic treatment is necessary to encourage self-care and establish a cooperative relationship among the patient, his family, and the health professionals, in order to effect the relief of fecal impaction, the maintenance treatment, and sphincter reconditioning^(14, 16, 18).

Physical-therapy sessions that emphasize abdominal massage are effective in the prevention and treatment of functional intestinal conditions. Two weekly physical-therapy sessions for 6 weeks can reduce the patient's symptoms, increase his functional capacity, and improve his quality of life⁽²²⁾. Abdominal massage facilitates the transit of the fecal bolus and stimulates the defecation reflex, and is an efficacious, less burdensome, and less invasive alternative that improves intestinal function and decreases abdominal pain caused by constipation⁽²²⁾. The benefit of physical-therapy manipulation to patients who are paraplegic due to medullar trauma and are constipated is well established⁽²⁾. The present study had the objective of evaluating over the long term, the effects of physiotherapeutic intervention and the daily ingestion of a laxative fruit drink on the treatment of chagasic megacolon.

METHODS

Study population

We identified records of 35 patients with megacolon demonstrated by barium enema and positive serology for Chagas' disease, with follow-up in the last 10 years (1998-2008) in the HUM. Of these, 8 had died, 10 were for patients undergoing conservative (non-surgical) treatment, and 17 were for patients who had undergone surgical correction of megacolon, of whom 5 had proven relapses. Seven individuals who had not undergone surgical intervention and 5 with post-surgery relapses were included in this quantitative, prospective, and comparative study. The sample was composed of 8 male and 4 female participants, with a mean age of 67 ± 12 years. The patients were contacted between March 2008 and February 2009, through active searching by means of telephone calls, visits to the walk-in clinic, the HUM hospital, and the Chagas' Disease Laboratory of the State University of Maringá (LDCh/UEM), and announcements about the study on a local radio program. The participants were informed about the purpose of the study, and signed the consent form approved by the Ethics Committee on Research Involving Human Beings of the State University of Maringá, opinion no. 319/2007.

Criteria for inclusion

Individuals with positive serology for Chagas' disease, with the diagnosis confirmed by barium enema for megacolon and symptoms of constipation, who agreed to participate in physical-therapy sessions twice a week for 6 weeks, and use a daily laxative fruit drink.

Criteria for exclusion

Individuals who after clinical assessment were not in a position to carry out the proposed treatment, or who attended the program less often than twice a week and/or for fewer than 10 sessions, and who did not agree to the daily use of a laxative fruit juice. Under these criteria, one patient was excluded from the study for appearing for only two physiotherapy sessions.

Evaluation of clinical signs and intestinal constipation

All the patients were given a medical examination and answered a questionnaire that used a scale to evaluate the degree of intestinal constipation^(8, 27) at the beginning and end of the 6-week protocol, and again 12 months after the end of the protocol. The survey was practical, easy to understand, and included eight items regarding signs and symptoms characteristic of constipation. For each item, the patient assigned a score, 0 (for no problem), 1 (some problem), or 2 (severe problem). The items treated were: abdominal distension, change in the amount of gas passed, lower frequency of bowel movements, output of liquid stool, sensation of pressure or rectal fullness, anal pain during bowel movements, passing a small amount of stool, incapacity to pass stool. A total score of 0 indicates that no problem exists, and a total of 16 indicate a severe problem of intestinal constipation (Figure 1).

1	Abdominal	0	1	2
2	Change in the amount of gas passed	0	1	2
3	Less-frequent bowel movements	0	1	2
4	Passing liquid stools	0	1	2
5	Sensation of pressure or fullness in the rectum	0	1	2
6	Rectal pain during bowel movements	0	1	2
7	Passing a small amount of stool	0	1	2
8	Incapacity to pass stools	0	1	2

Assign 0 if there is no problem, 1 for some problem, and 2 for a severe problem, for the items above. A total score of zero indicates that no problem exists; and a total of 16 indicate a severe problem of intestinal constipation

FIGURE 1. Scale for evaluating intestinal constipation

Physiotherapy intervention combined with a laxative fruit drink

The patients received 12 physiotherapy sessions twice a week for a total of 6 weeks. The protocol consisted of abdominal massage, 10 repetitions of abdominal pressure and 10 alternating flexes of the hips and knees. Each session lasted approximately 20 minutes. Superficial and deep kneading was performed, beginning with the ascending, transverse, and descending colon. Abdominal pressure was done in conjunction with the intestinal massage, pressing the bent legs over the abdomen to help expel the stool because of the lever mechanism and the increase in abdominal pressure⁽¹³⁾. The mechanical stimulation

of the gastrointestinal tract produced by the massage and the mobilization of the lower limbs may contribute to the development of gastrointestinal symptoms, since when the intestinal mucosa is stretched and/or irritated it releases vasoactive intestinal peptide and prostaglandins, causing increased intestinal secretion and diarrhea⁽²⁴⁾. The patients were provided transport in order to attend the physiotherapy sessions.

Together with the physical therapy, the patients received a laxative fruit drink prescribed by an HUM dietitian (5 pitted prunes left in water overnight in the refrigerator, 1 tablespoon heavy cream, 1 orange, peeled and seeded, a slice of papaya, without the peel and with seeds, and a glass of ice water, mixed in a blender, without straining). The patients were directed to drink this each day, on an empty stomach, during the treatment period. The ingredients of the drink were provided to patients who reported some difficulty in obtaining them. The patients were requested to suspend the use of laxatives and only use them if more than 3 days passed without a bowel movement.

Evaluation of the treatment

At the end of the protocol (6 weeks), and after 12 months, the scale of constipation was again assessed. After these intervals, the follow-up was based on the use of the laxative fruit drink, the frequency of bowel movements, use of laxatives, enemas, and complaints of constipation.

The present study did not establish a group with no intervention, because of the small size of the sample. This was due to difficulties in contacting patients because of outdated addresses, patients living in nearby towns, or patients who were unable to adhere to the protocol. Another limiting factor was that this study was conducted according to the policies of LDCh/UEM, which serves patients with Chagas’ disease in a holistic and multidisciplinary fashion to recommend improvements, and therefore does not exclude any patient from prescribed procedures. In view of this, it was determined that the evaluation of the effect of physiotherapy intervention combined with the use of the fruit drink would be carried out over some time.

Statistical analysis

The statistical analysis was done using the program Statistica version 8.0 by StatSoft, Inc. (2007). Fisher’s Exact test was used to assess the relationship between the patients’ sex and the physiotherapy treatment combined with fruit drink, and also to assess the relationship between surgical and non-surgical patients and the intervention. The comparison between the intervention and age of the patients was done by the Mann-Whitney test. To evaluate the difference in laxative use, McNemar’s test was used. The values of the constipation scale before and after the intervention were compared by the non-parametric Wilcoxon test. The significance level was 5%.

RESULTS

As seen in Table 1, there was no significant difference with respect to the physiotherapy treatment combined with the use of a fruit drink, for age ($P = 1.0000$), sex ($P = 0.5474$), whether or not surgery was performed ($P = 1.0000$), or the use of a laxative

($P = 0.0736$). At the beginning of the treatment, seven individuals (58.3%) were using conventional laxatives, and at the end (after 6 weeks) only two patients continued using them.

TABLE 1. Relationship between the physiotherapy/fruit drink treatment and the patients’ age and sex, whether surgery was performed, and use of a laxative

Patient	Age*	Sex**	Surgery***	Laxative at beginning	Laxative at end****
1	68	M	No	No	No
2	67	F	No	Yes	No
3	80	M	No	Yes	Yes
4	67	F	Yes	Yes	No
5	76	F	No	No	No
6	55	F	No	Yes	Yes
7	65	M	Yes	Yes	No
8	72	M	No	No	No
9	56	M	Yes	Yes	No
10	71	M	Yes	No	No
11	51	M	Yes	No	No
12	81	M	No	Yes	No

* $P = 1.0000$ relationship between age and the physiotherapy treatment combined with the fruit drink;

** $P = 0.5474$ relationship between sex and the treatment;

*** $P = 1.0000$ relationship between surgical/non-surgical patients and the treatment;

**** $P = 0.0736$ relationship between the use of a laxative at the beginning and at the end (after 6 weeks) of treatment

The Wilcoxon test indicated a significant decrease in the scores on the constipation scale after 6 weeks of intervention in 11/12 (91.7%) patients ($P < 0.0022$) and 12 months after the end of the protocol in 8/11 (72.7%) patients ($P < 0.0100$), indicating improvement. One patient (8.3%) did not benefit from the treatment, with no change in the score on the constipation scale (Table 2).

TABLE 2. Relationship between the physiotherapy/fruit drink treatment and the scores on the constipation scale before beginning the treatment, after 6 weeks of treatment (end of the protocol), and 12 months after the end of the protocol

Patient	Initial score (before treatment)	Score after 6 weeks of treatment *	Score 12 months after the end of treatment **
1	7	6	6
2	12	3	1
3	3	2	4
4	10	0	9
5	4	0	1
6	10	10	10
7	4	2	2
8	4	0	0
9	11	4	10
10	7	5	7
11	6	1	4
12	8	2	Died

* $P < 0.0022$ comparison between the constipation scores before and after the 6 weeks of treatment;

** $P < 0.0100$ comparison between the constipation scores before and after 12 months from the end of the treatment

Monitoring over time in the interval between 6 weeks and 12 months showed that after 3 months, six patients (50%) continued using the laxative cocktail, with bowel movements every day or every 2 days, two (16.6%) were using laxatives, and two (16.6%) complained of constipation. One patient (8.3%) died from respiratory complications. Evaluation after 6 months indicated that two (16.6%) patients continued to use the laxative fruit drink with bowel movements every day or every 2 days, four (33.3%) had begun to use laxatives frequently, two (16.6%) had an enema in the last 3 months, and two (16.6%) complained of incomplete bowel movements. After 12 months, only one (8.3%) patient was taking the laxative fruit drink, with daily bowel movements, three (25%) continued using laxatives, two (16.6%) had an enema in the last 3 months, and three (25%) complained of incomplete bowel movements. Even with guidance, no patient reported carrying out self-massage.

Other results that demonstrated the efficiency of the proposed protocol were that during the intervention, seven patients (58.3%) had softer stools, nine (75%) had increased frequency of bowel movements, and there was no fecal impaction or the need for an enema. Four individuals (33.3%) reported flatulence and abdominal distension with the use of the laxative fruit drink, and eight (66.6%) reported abdominal distension with the use of massage. One individual (8.3%) reported the disappearance of daily headaches, and another (8.3%) indicated that the defecation reflex reappeared, which had not been present prior to the intervention. Prior to the treatment, 50% of the patients experienced anal pain during defecation, and this symptom persisted in only two of them.

DISCUSSION

The results of this study are integrated into the objective of the LDCh/UEM, which is to provide improved service to patients with Chagas' disease. The staff of this laboratory is experienced in conducting multidisciplinary treatments, involving medical professionals, pharmacists, psychologists, social workers, physiotherapists and nutritionists, to better serve individuals infected with *T. cruzi*^(11, 19, 25, 29, 30). Therefore in this study, we evaluated the physiotherapy interventions combined with daily intake of a fruit drink as a complementary approach in the treatment of chagasic megacolon. We observed that the scores on the constipation scale after 6 weeks of intervention and 12 months after the end of the protocol were significantly different from the scores before the intervention, indicating that there was a real and measurable benefit to the patients.

In this study, a high percentage (91.7%) of patients showed significant improvement after a relatively short period (6 weeks) of physical therapy intervention combined with a fruit drink, and 72.7% continued to show improvement after a longer period (12 months after the end of the intervention). With abdominal massage and a laxative diet, Castro⁽¹⁰⁾ also observed complete resolution of intestinal constipation in 70% of children with tetraplegic cerebral paralysis, and Guimarães et al.⁽¹⁹⁾ observed an improvement in gas expulsion and abdominal distension in a case of chagasic megacolon treated by the LDCh/UEM.

A result that also showed the beneficial effects of the treatment was that a significant percentage of patients had softer stools, decreased anal pain on evacuation, increased frequency of bowel movements, and reduction in the use of laxatives. At the beginning of the treatment, seven individuals used laxatives, and at the end only two continued using them. Although this difference was not significant at the 5% level, it was significant at 7% ($P = 0.0736$). This result may be related to the sample size, which although small did allow us to provide evidence of this difference, which can translate as a real benefit. Improvements of this nature were also observed by Castro⁽⁸⁾ when abdominal massage and a laxative diet were used.

We should stress that although we observed significant differences in the scores on the constipation scale after 1 year of intervention, monitoring over this interval and 3, 6, and 12 months after the end of treatment showed that the longer the time after treatment, the less the patients continued to use the fruit drink and perform self-massage, with a consequent increase in the use of laxatives and complaints of constipation. These results indicate that although the 12-session protocol is efficient, it is not sufficient to change the patients habits so they continue to practice the prescribed treatment. This may be related to the failure of each patient to take responsibility for his own well-being, that is, self-care, indicating that the massage and fruit drink should be continued for a longer period so that the qualified professional can guide the patients and make them aware of the benefits of a change in behavior. The lack of self-care was also observed by Rodrigues et al.⁽³³⁾, who observed that diabetic patients, even those with good knowledge of their disease, did not change their behavior to deal with it more adequately.

During the implementation of the protocol, there were complaints of bloating and flatulence with the use of the laxative fruit drink. Robb-Nicholson⁽³²⁾ reported that the use of fruits can increase flatulence because of the trisaccharides that they contain. Sandison and MacDonald⁽³⁵⁾ observed that 46.7% of menopausal women developed flatulence with the consumption of fruits and vegetables. Bacteria present in the colon produce hydrogen through the fermentation of fructose, resulting in abdominal distension and flatulence⁽²⁶⁾.

In the present study, one patient reported relief from daily headaches after the intervention. Aamodt et al.⁽¹⁾ observed that there is a high prevalence of headaches in individuals with gastroesophageal reflux, diarrhea, constipation, or nausea. The association between headaches and gastrointestinal symptoms may be related to the interactions between the nociceptive system and the autonomic nervous system. Headaches appear to be related to constipation, and the consumption of fruits, vegetables, and a fiber-rich diet reduces their frequency⁽³⁶⁾.

Another finding in our study was the report of one patient about the reappearance of the defecation reflex, which was absent prior to the intervention. Harrington and Haskvitz⁽²⁰⁾ observed in one patient with slow intestinal transit that abdominal massage stimulated the passage of the feces through the intestinal tract, reduced transit time, and increased the volume of stool in the rectum, causing an increase in the

sensory awareness of the need to defecate. With this, the authors reported that the patient no longer needed digital manipulation in order to pass a stool.

Regular abdominal massage is easy to execute and is most appropriate for patients with slow intestinal transit, reducing transit time in the colon⁽²⁰⁾. If it is administered for a minimum of 4 to 6 weeks, a marked improvement in peristalsis, increased frequency of bowel movements, and reduced bloating and flatulence, as well as a reduction in the use of laxatives can be observed^(13, 18, 20, 21, 38). Intestinal function was found to improve in constipated patients when massage was used in combination with physiotherapeutic treatment and nutritional reeducation⁽³¹⁾.

The protocol proposed in this study did not benefit one patient, who showed no change in the score on the constipation scale. However, this patient was taking antidepressants, which can affect intestinal motility. Uher et al.⁽³⁷⁾ also observed intestinal constipation associated with the use of an antidepressant in 33% of the patients that they studied.

It is known that the prevalence of constipation is related to age and sex. Women are usually more prone to constipation than men, but with advancing age constipation appears in both sexes⁽³⁹⁾. In the present study, we observed that independently of sex and age, the treatment protocol was efficient in effecting an improvement in intestinal function. It may be that age and sex did not really influence the effect of the protocol, or that such a difference was not observed because of the small size of the sample. The small sample size was indeed a limiting factor of our study, since we encountered difficulties in contacting the patients because their addresses were out of date or they lived in nearby towns, or had difficulty in adhering to the protocol. In spite of this limitation, the results of this study provide important information for the evaluation of the clinical practice with the potential for immediate application, thus serving as a pilot study and a model to encourage the incorporation of the protocol into the present health system in our country. These results can also serve as a basis for designing future studies using other methods and larger numbers of participants.

They will be of immediate benefit for patients associated with different groups caring for persons with Chagas' disease in various regions of Brazil.

Since constipation is a common condition and is prevalent in different chronic diseases, and regular abdominal massage/fruit drink is simple to administer, it is also possible to incorporate this therapy in a standardized fashion into an outpatient regime for megacolon with other etiologies. Much of the Brazilian population has access to health care from basic health units, and this protocol can be used even in towns far from large population centers. The protocol can also be used by family-health teams in their home visits, especially for elderly patients who are confined to bed due to degenerative brain diseases or cerebral ischemia.

New educational strategies can be used for the chronically constipated patient, to make him or her aware of the benefits of daily self-care, including daily use of the laxative fruit drink and the formation of groups of constipated patients to carry out self-massage in basic health units.

CONCLUSION

The proposed protocol of 12 physical therapy sessions combined with a laxative fruit drink is easy, safe, and noninvasive, and provides benefits regardless of sex and age, to increase peristalsis and the frequency of bowel movements, and reduce bloating and flatulence as well as the use of laxatives. It should be emphasized that although we have been careful in collecting and analyzing data, these were obtained from a small sample and no control group, indicating that additional studies should be performed to confirm these findings.

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RESUMO – *Contexto* - O tratamento da colopatia chagásica restringe-se ao manejo clínico no início do processo e, para pacientes sem indicação ou condição cirúrgica, utiliza-se de dietas anticonstipantes e administração judiciosa de laxantes e lavagens intestinais. *Objetivo* - Avaliar ao longo do tempo os efeitos das intervenções da fisioterapia associada à ingestão diária de coquetel de frutas no tratamento do megacolo chagásico. *Método* - Em estudo quantitativo prospectivo e comparativo, 12 pacientes de ambos os sexos e com média de idade de 67 ± 12 anos foram avaliados clinicamente para realizarem 12 sessões de fisioterapia, 2 vezes por semana, associadas ao uso de coquetel de frutas. Os resultados foram quantificados pela escala de avaliação de constipação intestinal antes e após o tratamento. *Resultados* – Foi observada diferença significativa ($P < 0,0022$) nos valores da escala de constipação antes e após 6 semanas de intervenção em 91,7% dos pacientes e em 72,7% após 12 meses com a diminuição de medicações laxativas, fezes mais amolecidas e aumento da frequência de evacuações. As variáveis como sexo, idade e realização ou não de cirurgia não interferiram nos resultados obtidos ($P > 0,05$). *Conclusão* - O protocolo proposto é de fácil execução, seguro, não-invasivo, de baixo custo, com potencial para ser implantado nos serviços de saúde por apresentar benefícios, independente do sexo, da idade e do participante ter sofrido intervenção cirúrgica, melhorando a condição clínica de portadores de megacolo chagásico.

DESCRIPTORES – Megacolo. Constipação intestinal. Doença de Chagas. Dieta. Sucos.

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