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Topic: Achalasia Management: the South American viewpoint **Open Access**

Differences between idiopathic and chagasic achalasia

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ABSTRACT

Idiopathic and Chagas' disease achalasia are characterized by absent or partial lower esophageal sphincter relaxation, absence of peristaltic esophageal contraction, food retention in the esophagus and esophageal dilatation. The most frequent symptoms are dysphagia, regurgitation, heartburn, weight loss and non-cardiac chest pain. The diagnosis is made by radiologic examination and esophageal manometry, which is considered the most accurate exam to characterized achalasia. In both diseases there is destruction of the esophageal myenteric plexus. Despite similarities in clinical and manometric presentation there is evidence of greater loss of inhibitory neurons of the myenteric plexus in idiopathic achalasia, whereas in Chagas' disease there is a loss of both excitatory and inhibitory neurons. Such differences, though do not affect patients' clinical presentation, and hence treatment options should be the same for both diseases.

INTRODUCTION

Achalasia is a disease characterized by absent or partial relaxation of the lower esophageal sphincter, absence of peristaltic esophageal contraction, food retention and esophageal dilation[1,2].

The most common symptoms are dysphagia, regurgitation, heartburn, weight loss and non-cardiac chest pain[1]. The diagnosis is made by radiologic examination of the esophagus and esophageal manometry, which is the most accurate exam to characterized achalasia. In this test, achalasia is characterized by increased integrated relaxation pressure of the lower esophageal sphincter and absence of peristaltic contraction in the esophageal

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body[3]. Using high resolution manometry achalasia patients may be classified as type I, when there are no contractions in esophageal body during swallows, type II, characterized by pan-esophageal pressurization, or type III when there are high-amplitude simultaneous contractions in the distal esophagus[3].

The etiology of achalasia is unknown in most cases around the world, and may be multifactorial, including autoimmune, genetic and viral factors[2]. In idiopathic achalasia, there are evidences of autoimmune, genetic and viral etiology, due to the presence of specific autoantibodies associated with neuronal damage, occasional incidence in members of the same family, and presence of previous viral infection in these patients[2]. The disease occurs with an annual incidence of 1 in 100,000 and a prevalence of 10 in 100,000[4].

Achalasia may be caused by infection by the hemoflagellate protozoan Trypanosoma cruzi[5,6] which affects millions of people in Latin America and has been increasingly reported in the United States[7] and Europe[8]. This parasitic infection is the cause of Chagas' disease, and is characterized by myenteric inflammation, absent myenteric ganglion cells and myenteric neural fibrosis. These lesions are restricted to the esophagus in idiophatic achalasia[2], and may be seen in all digestive tract in Chagas' disease[5,6,9,10]. In Latin America Chagas' disease has an incidence from 1,000 in 100,000 to 4,000 in 100,000, however the number is decreasing, as 18 million in 1991 to 5.7 million in 2010[9]. It is estimated that 300,000 infected immigrants are living in United States[9]. From 7% to 10% of the infected individuals will have achalasia[5].

DIFFERENCES BETWEEN IDIOPATHIC AND CHAGAS' DISEASE ACHALASIA

Although both diseases cause the same alteration in the esophagus, including absent or partial relaxation of the lower esophageal sphincter, esophageal aperistlsis, and megaesophagus the loss of esophageal intrinsic innervations may not be the same[11-13].

While in idiopathic achalasia neural destruction has been suggested to be more intense in inhibitory nerves than in excitatory nerves, in achalasia caused by Trypanosoma cruzi infection neural impairment involves both inhibitory and excitatory innervations. Consequently lower esophageal sphincter pressure is frequently increased in idiopathic achalasia[14-17] and frequently decreased in Chagas' disease[16-19] which may explain the variation in the lower esophageal sphincter pressure[20], and the heterogeneity seen in these patients[21].

Previous studies have reported differences in esophageal response to gastrin[14,15,18] and to atropine[15,22]. These mechanisms have not been completely elucidated in Chagas' disease[11,13] [Table 1]. Although studies on idiopathic achalasia have demonstrated a partial opening of the upper esophageal sphincter with increased residual pressure during swallow[23], these features have not been fully demonstrated in Chagas' disease[12,13]. The time between pharyngeal contraction and proximal esophageal contraction (5 cm distance) after wet swallows in patients with megaesophagus is increased in Chagas' disease but not in idiopathic achalasia[24]. Contractions in the esophageal body are not of the same intensity, and tend to be more intense in patients with idiopathic achalasia[19,25]. In addition epiphrenic diverticula is more frequent on idiopathic achalasia (3.6% to 7.4%) than in Chagas' disease (1.5%)[13]. Also, high prevalence of circulating antibodies against M2 acethilcholine muscarinic receptor has been found in Chagas' disease patients with achalasia (84%), compared with patients with idiopathic achalasia (28%)[26].

Table 1: Differences between idiopathic achalasia and Chagas' disease

	Idiopathic achalasia	Chagas' disease
Gastrin action	Hipersensitivity	Hiposensitivity
Inhibitory innervation	Loss	Loss
Excitatory innervation	Present	Loss
α-adrenergics receptors	Predominating	Predominating
VIP	Decreased	Not investigated
Dopamine D2 receptors	Decreased	Not investigated
LES basal pressure	Increased	Decreased
Bothinun toxin response	LES pressure reduction (32% to 45%)	LES pressure reduction (23%)
Edrophonium response	Increase in esophageal pressure	Increase in esophageal pressure
Atropine response	Present	Partial
Circulating gastrin	Normal	Increased
Anti M2R antibody	Low prevalence (28%)	High prevalence (84%)
Epiphrenic diverticula	3.6% to 7.4%	1.5%

VIP: vasoactive intestinal polypeptide; LES: lower esophageal sphincter

CLINICAL PRESENTATION AND TREATMENT

Despite differences in pathophysiology of Chagas' disease-related and idiophatic achalasia, the clinical presentation in both diseases is the same, with dysphagia as a common complaint, affecting more than 90% of the patients. However, the symptoms occurs later in patients with Chagas' disease achalasia, a long time after the infection, and may be associated with aging-related changes in esophageal motility[10] in addition to impairment of esophageal myenteric plexus caused by the disease. In the evaluation of the water ingestion dynamics patients with dysphagia caused by Chagas' disease or idiopathic achalasia have the same behavior[27].

Taken together, both Chagas' disease-related and idiopathic achalasia have similar clinical and radiologic manifestations, including nonrelaxing or partially relaxing lower esophageal sphincter and esophageal aperistalsis, although the pathophysiology of the diseases should not be the same. Therefore, treatment of both conditions is similar, and include pneumatic dilation of the esophageal-gastric transition, laparoscopic Heller myotomy and, the more recent peroral endoscopic myotomy (POEM)[28-30]. Drugs and botulinum toxin may be used in special cases[31] and esophagectomy for advanced cases. There is no cure for the disease, and the objective of treatment is relieve the symptoms and permit an adequate food ingestion[31]. Drugs cause benefit for a short time and have side effects which may be intense. The remission of the symptoms with pneumatic dilatation may least for 5 to 10 years, but the most effective treatment is laparoscopic or endoscopic myotomy, with an improvement of the symptoms for 6 to 10 years[31]. The patients who have a better response to treatment, pneumatic dilation or Heller myotomy, are them who has isobaric panesophageal pressurization after swallowing.

DECLARATIONS

Authors' contributions

R.O. Dantas contributed solely to the paper.

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Conflicts of interest

There are no conflicts of interest.

Patient consent

Not applicable.

Ethics approval

Not applicable.

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