International Journal of Innovative Research in Medical Science (IJIRMS)
Volume 07, Issue 07, July 2022,
https://doi.org/10.23958/ijirms/vol07-i07/1437

Original article

A Comparison of Achalasia Quality of Life Index and Eckardt Scores in Assessing Severity of Achalasia Cardia and Prognosis at 3 Months - A Single-Center Prospective Observational Study

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Received 21 June 2022; Accepted 05 July 2022; Published 08 July 2022

Abstract

Background: Eckardt score and Achalasia quality of life score (ASQ) are two scoring systems used in achalasia. This study tries to compare these scores in assessing the severity of the disease before and 3 months after initiation of treatment. ***Methods:*** 40 patients newly diagnosed with achalasia cardia were included in this study. Eckardt score and ASQ scores were calculated at the time of presentation. Patients underwent either Laparoscopic Heller myotomy (LHM), Pneumatic dilatation (PD), or medical management with isosorbide dinitrate (ISDN) after diagnosis. Patients were followed up after 3 months and these scores were assessed again to compare their reductions in different interventions. ***Results:*** The majority of the patients in this study underwent LHM (62.5%) followed by PD (32.5%). The average ASQ scores before and after PD were 20 and 12.8 respectively. The average ASQ scores before and after LHM were 20 and 12 respectively. The average Eckardt scores before and after the procedure were 8 and 2 in the PD group whereas this was 8 and 1.92 in the LHM group. There was a significant reduction in both Eckardt score and ASQ score after 3 months from baseline values in both the LHM and the PD groups ($p<0.001$) but not in the ISDN group. All the patients categorized as treatment success by the Eckardt score were similarly categorized by the ASQ score also. The percentage reduction in Eckardt score was found to be statistically significant and this was more in the LHM and the PD groups than in the ISDN group ($p= <0.001$). Percentage reduction in ASQ score post-procedure was not a statistically significant entity in any of the groups. ***Conclusion:*** Both the Eckardt score and Achalasia quality of life score are equally effective in assessing treatment response in achalasia cardia. The percentage reduction in Eckardt score after the procedure was found to be statistically significant in LHM and PD groups and not in the ISDN group. There was no statistically significant percentage reduction in ASQ score in any of the procedural groups.

Keywords: ***Achalasia cardia, Eckardt score, Achalasia quality of life score***

Introduction

Achalasia cardia is a rare esophageal motility disorder with an annual incidence of 2/100,000 population and a prevalence of 10 per 100,000 population [1]. The usual age of presentation is 25 - 60 years [2]. The duration of symptoms before diagnosis varies from 6 months to 5.9 years [3,4]. Almost all patients have solid food dysphagia and the majority of patients complain of liquid dysphagia. High-resolution esophageal manometry and timed barium swallow are done to confirm the diagnosis and upper gastrointestinal endoscopy to rule out secondary causes of achalasia. Previous studies have shown that there is very little correlation between symptoms and manometry measurements [5]. Treatment options for achalasia include Laparoscopic Heller myotomy (LHM), Pneumatic dilatation (PD), and Peroral endoscopic myotomy (POEM). Other options include botulinum toxin injection and isosorbide dinitrate (ISDN).

Achalasia quality of life score (ASQ) and Eckardt score are the two patient-reported scoring systems used to assess the severity of disease and response to treatment. There are not many studies from South India comparing these scoring systems in assessing the severity of disease and prognosis at 3 months. Eckardt score includes only four parameters and is easy to assess. ASQ score is a ten-question questionnaire designed by Urbach and Colleagues [6]. ASQ score assesses the degree of difficulty in consuming multiple food items and also the impact of disease on daily living but is difficult to use in a busy clinic.

This study tried to compare the Achalasia quality of life index score and Eckardt score in assessing the severity of achalasia and prognosis at 3 months.

Materials and Methods

Study design

Single-center prospective observational study

Aims and objectives

1) To compare Achalasia quality of life score and Eckardt score in assessing the severity of achalasia cardia
2) To compare the Achalasia quality of life score and Eckardt score in assessing prognosis at 3 months after starting treatment.

Patients

Patients newly diagnosed with achalasia cardia in the institute of Medical Gastroenterology, Madras Medical College, Chennai.

Duration of study

6 months. (November 2021 to April 2022)

Inclusion criteria:

1) Age more than 18 years
2) Diagnosis of achalasia cardia by high-resolution esophageal manometry.

Exclusion criteria:

1) Gastric or esophageal malignancy
2) Esophageal stricture
3) Hiatal hernia greater than 5cm
4) Severe renal or liver disease
5) Patients on aspirin or steroids
6) Patients who did not follow up

Sample size: 40 patients

Study protocol

This is a single-center prospective observational study. The study was conducted from November 2021 to April 2022. All consecutive patients attending the outpatient department of Madras Medical College, Gastroenterology Institution with a clinical history suggestive of motor dysphagia were assessed for achalasia cardia. Relevant history and routine blood investigations were done followed by barium swallow, upper gastrointestinal endoscopy, and high-resolution esophageal manometry in all the patients. High-resolution manometry was performed using 16-channel water perfused catheter and Trace 1.3.3 software. The catheter was introduced transnasally. After recording baseline parameters, ten 5 ml wet swallows are given and the data recorded is analyzed using Chicago V 3.0. [7].

Patients newly diagnosed with achalasia cardia by high-resolution manometry were included in this study. Achalasia quality of life score and Eckardt score were calculated at the time of diagnosis. The type of achalasia cardia and various manometry parameters were also noted. Patients were receiving standard treatment for achalasia cardia indicated by the type and severity of their disease, availability of resources, and patient preferences. Treatment undertaken after the diagnosis was noted and the patients were reviewed after 3 months of initiating treatment. At the end of three months of initiating treatment, the Achalasia quality of life score and the Eckardt scores were again calculated. Eckardt score <4 and ASQ score <15 were considered indicators of treatment success based on previous studies [8,9].

ECKARDT SCORE

GRADE	Dysphagia	Regurgitation	Retrosternal pain	Weight loss (Kg)
0	None	None	None	None
1	Occasional	Occasional	Occasional	<5
2	Daily	Daily	Daily	5-10
3	Each meal	Each meal	Each meal	>10

ASQ Questionnaire

1. How much has achalasia limited the types of food you have been able to eat in the last month?

Number	Question	Score
a	Not limited at all (I can eat and drink all foods that I would like to)	1
b	Somewhat limited (I can eat and drink most of the foods that I would like to)	2
c	moderately/severely limited (I can eat and drink very few of the foods I would like to)	3

2. Raw fruits and vegetables

a	Can swallow without problem	1
b	Can swallow, but with some difficulty	2
c	Can swallow with great difficulty or not at all	3

3. Rice

a	Can swallow without problem	1
b	Can swallow, but with some difficulty	2
c	Can swallow with great difficulty or not at all	3

4. Clear fluids (water, juice, coffee, tea)

a	Can swallow without problem	1
b	Can swallow, but with some difficulty	2
c	Can swallow with great difficulty or not at all	3

5. How often in the past month have you needed to drink water while eating to deal with food caught in your esophagus?

a	Never/ rarely	1
b	Sometimes	2
c	Frequently/ every time I eat	3

6. How often have you experienced pain when eating during the past month?

a	Never	1
b	Rarely	2
c	Sometimes	3
d	Frequently / every time I eat	4

7. During the past month, how much of a problem was heartburn (burning pain behind the lower chest) for you?

a	No problem	1
b	Mild problem	2
c	Moderate problem	3
d	Severe problem	4
e	Very severe problem	5

8. When you sit down to eat a meal, are you bothered by how long it takes you to finish eating?

a	No, I eat as quickly as I like	1
b	Yes, I am bothered by how long it takes me to eat	2

9. Has having achalasia limited your lifestyle?

a	No, it is not limiting at all	1
b	Yes, it has limited my lifestyle	2

10. How much do you agree with the following statement about how satisfied you are with your health in regard to achalasia?
I am satisfied with my health in regard to achalasia

a	Strongly agree	1
b	Agree	2
c	Neither agree nor disagree	3
d	Disagree	4
e	Strongly disagree	5

Statistical analysis

Data were entered in MS Excel and analysis was done using SPSS 21.0 version. Data were presented as mean and standard deviation for continuous variables and as percentages for categorical variables. Unpaired t-test was done to compare two group means and ANOVA for more than two group means. Paired t-test was done to compare paired means within the group. Pearson correlation was done to compare two continuous variables. A p-value of less than 0.05 was considered significant

Results

A total number of 40 patients were included in this study. All the patients were followed up at the end of 3 months of treatment. The mean duration of symptoms before diagnosis, in this study, was 2.4 +- 2.4 years. The mean IRP was 33.9 +- 12.2 mmHg. 77.5% of the patients in this study were males and 22.5% were females. The mean age of the patients was 39.9 +- 15.5 years. Type 2 achalasia cardia was the most common type (57.5%) followed by type 1 (35%) and type 3 (7.5%). LHM was done in 62.5% and PD in 32.5% of patients. 2 patients preferred medical management with ISDN. 65% of the patients did not have any addiction. 25% of the patients used to drink alcohol and 22% smoked cigarettes regularly. 82.5% of patients did not have any other comorbidity. Most of the patients had daily difficulty in swallowing (43%). Dysphagia with each meal was seen in 20% of the patients. Occasional dysphagia was reported by 37.5% of the patients. The most common symptom other than dysphagia was regurgitation (85%) followed by chest pain (45%), difficulty in belching (42.5%), hiccups (15%), and globus pharyngeus (10%). 95% of the patients had some amount of weight loss. All patients had endoscopic features suggestive of achalasia cardia. Antral gastritis was noticed in 20% and esophageal candidiasis in 10% of the patients during endoscopy. Type 1, type 2, and type 3 esophagogastric junction (EGJ) morphology were noticed in 70%, 27.5%, and 2.5% of the patients respectively. The average ASQ scores before and after PD were 20 and 12.8 respectively. The average ASQ scores before and after LHM were 20 and 12 respectively. The average Eckardt scores before and after the procedure were 8 and 2 in the PD group. This was 8 and 1.92 in the LHM group. There was a significant reduction in both Eckardt score and ASQ score after 3 months from baseline values in both the LHM and PD groups ($p<0.001$) but not in the ISDN group. The percentage reduction in Eckardt score was found to be more in the LHM and the PD groups than in the ISDN group ($p= <0.001$). No statistically significant percentage reduction was noted in the ASQ score post-procedure in any of the groups.

Discussion

In this study, forty consecutive patients newly diagnosed with achalasia cardia were included after confirming the diagnosis with high-resolution esophageal manometry. Eckardt score and ASQ scores at the time of diagnosis and 3 months after treatment were assessed. Patients were followed up by either outpatient visits (62.5%) or by telephonic conversation (37.5%). The mean age of presentation in this study was 39.9 +- 15.5 years. In a cross-sectional study by Slone et al. the mean age of the patients was 62 years whereas it was 36 years in a study by Ghoshal et al. [8,10]

The mean duration of symptoms in this study was 2.4 +- 2.4 years. The retrospective study by Jain et al showed a mean duration of symptoms of 18 months [2]. A study by Ghoshal et al. showed a duration of 3.8 years before diagnosis [10]. This long duration of symptoms could be often due to initial presentation to other specialists than a gastroenterologist [2].

In this study, Type 2 achalasia cardia was the most common type (57.5%) followed by type 1 (35%) and type 3 (7.5%). Similar results were seen in previous studies by Khan et al and Lee et al [3,11]. A study by Pratap et al. showed Type 1 and 2 of similar frequency and the best response to PD was seen with type 2. The majority of the patients in this study did not have any significant addiction or comorbidity. All patients had dysphagia. The majority of the patients had dysphagia on a daily basis (43%). Dysphagia with each meal was seen in 20% and occasional dysphagia was seen in 37% of patients. Boeckxstaens et al reported dysphagia in more than 90% of the patients with achalasia, along with regurgitation in 76-91%; heart burns in 25- 64%; weight loss in 35- 91% [12]. In the present study, regurgitation was seen in 85% of the patients. Other symptoms were difficulty in belching (43%), hiccups (15%), and globus pharyngeus (10%). 95% of the patients had some amount of weight loss. Heartburns in achalasia cardia could be due to dysmotility, lactic acid production by bacterial fermentation of stagnant food, or reduced clearance of refluxed gastric acid [13]. Features of achalasia cardia were noticed in all the patients during Endoscopy in this study. Endoscopic features suggestive of achalasia cardia include dilated esophagus with food stasis, reduced peristaltic activity, and a tight lower esophageal sphincter [14].

In the present study, 10% of the patients had esophageal candidiasis and 20% had antral gastritis. The prevalence of esophageal candidiasis in achalasia had not been studied before

[15,16]. There was no significant difference in Eckardt score and ASQ score post-procedure based on gender, grade of dysphagia, or EGJ morphology in this study.

The majority of the patients in this study underwent LHM (62.5%) followed by Pneumatic dilatation (32.5%). The average ASQ scores before and after PD were 20 and 12.8 respectively and after LHM were 20 and 12 respectively. The average Eckardt scores before and after the procedure were 8 and 2 in the PD group and 8 and 1.92 in the LHM group. In a study by Slone et al, Eckardt score ≥ 4 and ASQ score ≥ 15 had the best discrimination between treatment improvement and failure [8]. In a study by Chrystoja et al., there was no difference in the improvement of ASQ scores between LHM and PD at one year [9]. In this study, there was a significant reduction in both Eckardt score and ASQ score after 3 months from baseline values in both the LHM and PD groups ($p<0.001$) but not in the ISDN group. All the patients categorized as treatment success by the Eckardt score were similarly categorized by the ASQ score also. In this study, the average percentage reduction of Eckardt score was found to be more among those with type 3 achalasia followed by type 2 and type 1. The difference was statistically significant ($p=0.042$). The percentage reduction in Eckardt score was found to be more in the LHM and the PD groups than in the ISDN group ($p= <0.001$). No statistically significant percentage reduction was noted in the ASQ score post-procedure in any of the groups.

Conclusion

Both the Eckardt score and the Achalasia quality of life score are equally effective in assessing treatment response in achalasia cardia. The percentage reduction in Eckardt score after the procedure was found to be statistically significant in LHM and PD groups and not in the ISDN group. There was no statistically significant percentage reduction in ASQ score in any of the procedural groups

Limitations

The study had a small sample size. Post-procedure treatment response could not be objectively verified. Longer follow-up with objective verification of treatment response by either post-procedure endoscopy, high-resolution esophageal manometry, or timed barium swallow study is needed for better comparison of these scoring systems.

List of abbreviations

ASQ: Achalasia quality of life score
EGJ: esophagogastric junction
IRP: Integrated relaxation pressure
ISDN: Isosorbide dinitrate
LHM: Laparoscopic Heller myotomy
MS: Microsoft
PD: Pneumatic dilatation
POEM: Peroral endoscopic myotomy

Ethical committee declarations

Ethical committee clearance was obtained from the Institutional Ethical Committee Board.

Conflict of interest

None

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Appendix: Tables and Charts

Table 1: Age and ASQ score after 3 months were the only parameter found to below positive correlated with statistical significance (p=0.009)

Parameters		Pearson Correlation	P Value
Duration Of Symptoms	Ekcardt score before procedure	-0.072	0.659
	Eckardt score after 3 months	0.038	0.815
	Eckardt percentage reduction	-0.032	0.843
	Asq score before procedure	0.017	0.915
	Asq score after 3 months	0.129	0.428
	Asq percentage reduction	-0.073	0.656
Weight Loss	Ekcardt score before procedure	0.252	0.116
	Eckardt score after 3 months	0.082	0.614
	Eckardt percentage reduction	0.051	0.757
	Asq score before procedure	0.066	0.686
	Asq score after 3 months	0.093	0.568
	Asq percentage reduction	0.005	0.977

Table 2: There was significant reduction in both EKCARDT score and ASQ score after 3 months from baseline values.

		Mean	SD	Paired t test p value
Ekcardt score	Before procedure	7.875	1.6359	<0.001
	After 3 months	2.100	.7779	
Asq score	Before procedure	19.900	2.6966	<0.001
	After 3 months	12.275	1.1544	

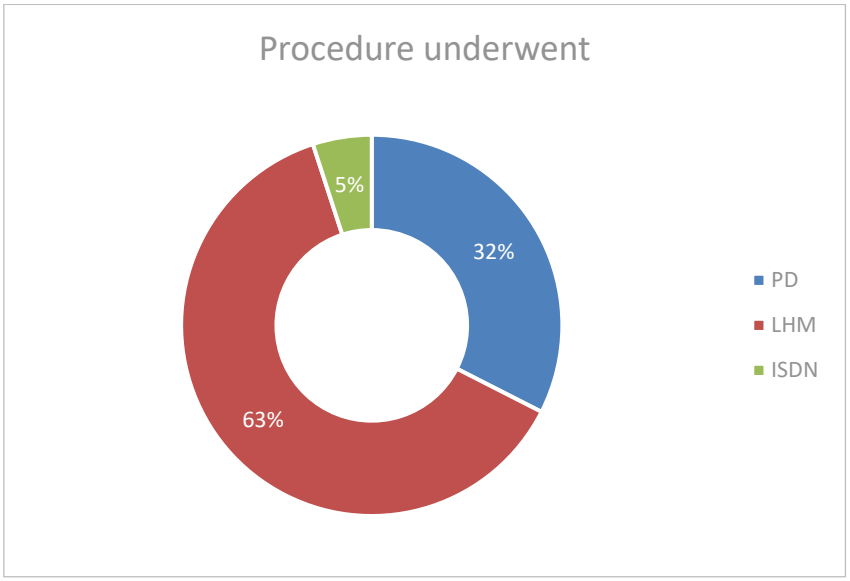

Figure 1: Procedures underwent

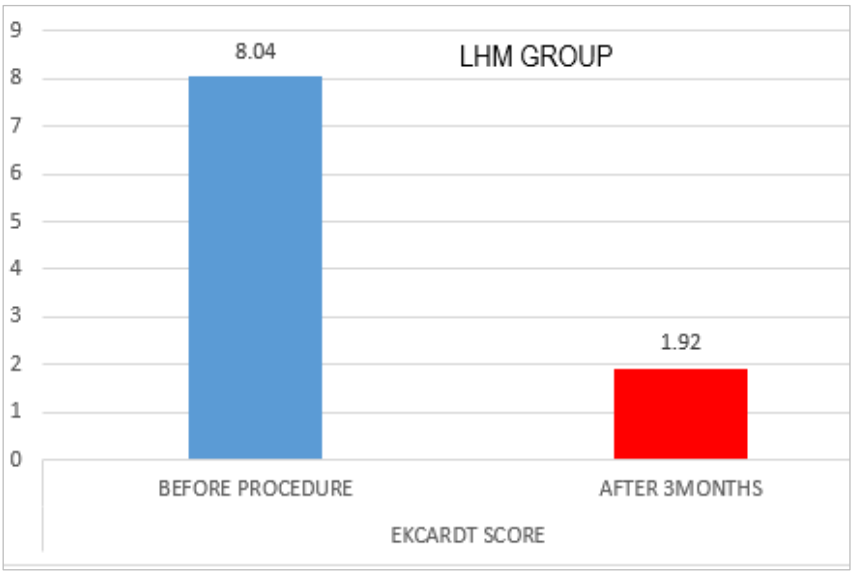

Figure 2: Eckardt score in LHM group (statistically significant reduction in Eckardt score)

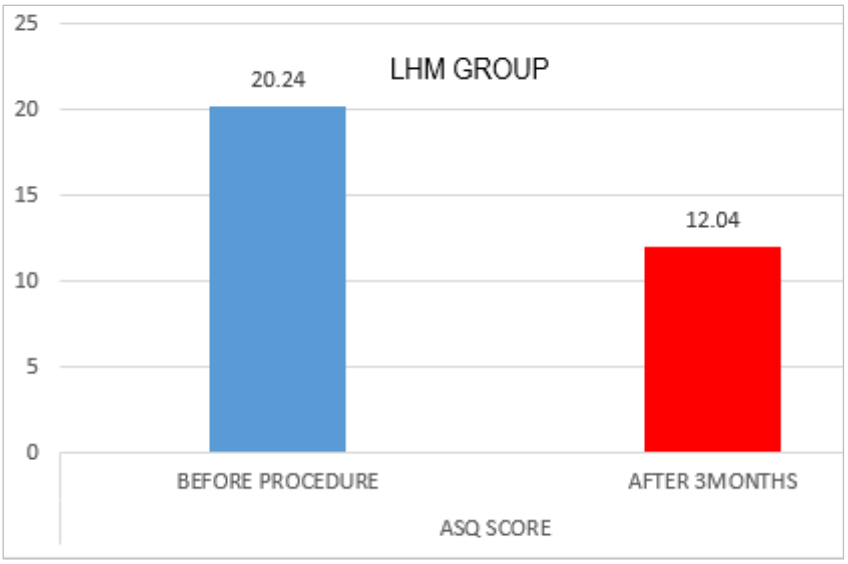

Figure 3: ASQ score in LHM group (statistically significant reduction in ASQ score)

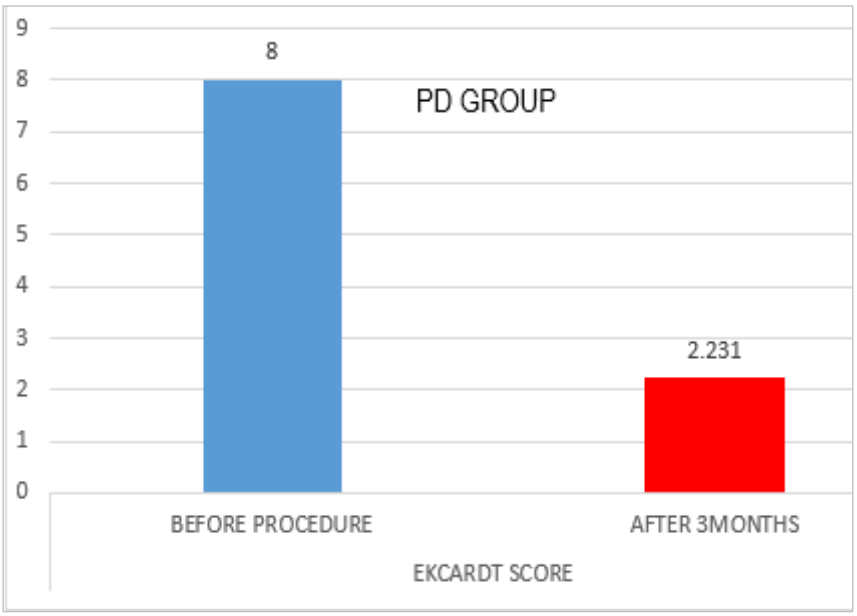

Figure 4: Eckardt score in PD group (statistically significant reduction in Eckardt score)

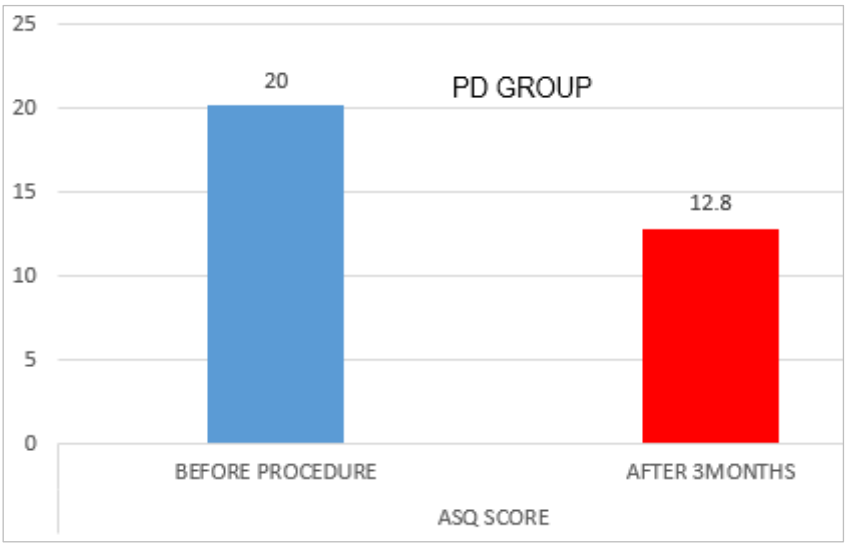

Figure 5: ASQ score in PD group (statistically significant reduction in ASQ score)