Egyptian Journal of Chest Diseases and Tuberculosis (2016) 65, 845–850

HOSTED BY

The Egyptian Society of Chest Diseases and Tuberculosis

Egyptian Journal of Chest Diseases and Tuberculosis

www.elsevier.com/locate/ejcdt
www.sciencedirect.com

ORIGINAL ARTICLE

Evaluation of some pulmonary functions and pleuropulmonary complications after endoscopic sclerotherapy of gastric fundal varices at Zagazig university hospitals

Jihan A. Shawky [a], **Hosam M. Dawod** [a], **Waleed Mansour** [b,*]

[a] *Department of Tropical Medicine, Faculty of Medicine, Zagazig University, Egypt*
[b] *Chest Department, Faculty of Medicine, Zagazig University, Egypt*

Received 11 February 2016; accepted 20 March 2016
Available online 10 August 2016

KEYWORDS

Pulmonary functions;
Gastric varices;
Sclerotherapy;
Incentive spirometry

Abstract *Background:* Incidence of gastric fundal varices is about 16–70% of patients with portal hypertension. It causes upper gastrointestinal bleeding in about 10–15% of cases. There are different methods used for the management of gastric varices. Endoscopic injection of N-Butyl-Cyanoacrylate (NBCA) is considered to be the choice for control of active bleeding from gastric varices. Pulmonary complications of sclerotherapy are common and varying from minor complications to severe complications as pleural effusion, lung collapse, consolidation, adult respiratory distress syndrome and pulmonary embolism.

Aim: To evaluate pulmonary functions after endoscopic sclerotherapy of gastric fundal varices by N-Butyl-Cyanoacrylate and the effect of incentive spirometry (IS) on post sclerotherapy pulmonary functions.

Methods: Sixty patients with liver cirrhosis and portal hypertension were included in the study. All patients were subjected to full history and careful clinical examination, upper GI endoscopy, Child-Turcotte-Pugh classification, chest X-ray and high resolution CT chest with contrast on the day just before endoscopy and within 48 h post procedure, ABGs and spirometry for FVC (%pred), FEV_1 (%pred), FEV_1/FVC%, FEF 25–75 (%pred) and PEFR (%pred) 6 h before and 2 days after GI endoscopy. Patients were divided into two groups according to the result of upper GI endoscopy: Group 1: included 30 patients with liver cirrhosis and portal hypertension, with upper GI endoscopy revealed gastric fundal varices and injection sclerotherapy with NBCA was done; Group 2: included 30 patients with liver cirrhosis and portal hypertension with upper GI endoscopy showed no gastric fundal varices or non risky, small sized fundal varices which were

Abbreviations VC, vital capacity; FVC, forced vital capacity; FEV_1, forced expiratory volume in 1 s; PEFR, peak expiratory flow rate; FEF, forced expiratory flow; FEV_1/FVC%, the percentage ratio of forced expiratory volume in 1 s and forced vital capacity; FEF 25–75, forced expiratory flow between 25% and 75% of FVC; ABGs, arterial blood gases; SaO_2, oxygen saturation; Pao_2, arterial oxygen tension; $Paco_2$, arterial carbon dioxide tension; CTP, Child-Turcotte-Pugh; IS, incentive spirometry

* Corresponding author.

Peer review under responsibility of The Egyptian Society of Chest Diseases and Tuberculosis.

http://dx.doi.org/10.1016/j.ejcdt.2016.03.011

not injected. G1 was further divided randomly into 2 subgroups (G1a and G1b) with measurement of ABGs and spirometry parameters after application of incentive spirometry.

Results: 16.67% and 6.67% of patients in group (1) developed pleural effusion and atelectatic bands of the lung respectively after sclerotherapy. There was a statistically significant decrease in PaO_2, FVC (%pred), FEV_1 (%pred) and FEF 25–75 (%pred) in group (1) after sclerotherapy from 80.12 ± 12.91, 98.25 ± 10.74, 90.86 ± 4.21 and 82.12 ± 29.21 to 71.96 ± 19.89, 82.11 ± 9.61, 75.65 ± 3.15 and 50.03 ± 20.11 respectively. The deteriorated parameters in G1a was improved after the application of incentive spirometry for 2 days regarding PaO_2, SaO_2, FVC, FEV_1 and FEF 25–75 from 69.91 ± 17.93, 90.01 ± 3.84, 80.27 ± 8.71, 75.12 ± 1.96, 52.14 ± 19.24 to 83.23 ± 19.07, 97.85 ± 5.72, 88.97 ± 9.94, 87.01 ± 1.03, 72.91 ± 18.13, respectively, on the other hand, there was a non significant statistical difference in all parameters of G1b. Also, there was a significant correlation between numbers of NBCA ampoules used for sclerotherapy and decrease in Post procedure PaO_2, Post FEV_1 (%pred), Post FVC (%pred) and Post FEF 25–75 (%pred).

Conclusions: NBCA injection of gastric fundal varices was associated with significant, reversible deterioration in some pulmonary functions, atelectasis and minimal pleural effusion with significant rapid improvement if incentive spirometry is used.

Introduction

Incidence of gastric fundal varices (GV) is 16–70% in patients with liver cirrhosis and portal hypertension, and is responsible for 10–15% of variceal bleeding [1].

There are many methods for the management of gastric varices and these methods differ from primary to secondary prevention, and differ between institutions [2].

Injection sclerotherapy with N-Butyl Cyanoacrylate (NBCA) is thought to be the treatment of choice for active bleeding from gastric varices and prevention of rebleeding [3–5].

Gastric varices are less frequent than esophageal varices, but gastric varices are more dangerous and have higher mortality rate 60% [6]. Gastric varices have high incidence of rebleeding (34–89%) [7] and pulmonary complications of sclerotherapy are common and ranging from minor asymptomatic changes, to serious complications as aspiration, broncho-pneumonia, pleural effusions, lung collapse, adult respiratory distress syndrome and pulmonary embolism [8,9].

The aim of this study was to evaluate some pulmonary functions after endoscopic sclerotherapy of gastric fundal varices by NBCA injection and the effect of incentive spirometry (IS) on post sclerotherapy pulmonary functions.

Patients and methods

This study was conducted at Tropical Medicine and Chest Departments, Zagazig University Hospitals, between January 2014 and September 2015.

Sixty patients with liver cirrhosis and portal hypertension were included in this study, all patients were subjected to upper GIT endoscopy and were divided into two groups according to endoscopy finding:

Group (1): 30 patients with liver cirrhosis and portal hypertension and upper GIT endoscopy reveals fundal varix was injected with N-Butyl-Cyanoacrylate.

Group (2): 30 patients with liver cirrhosis and portal hypertension and upper GIT endoscopy was without injection sclerotherapy as there were no varices or small non-risky fundal varices.

Exclusion criteria:

- Patients with hepatocellular carcinoma.
- Patients with non cirrhotic portal hypertension.
- Patients with cardiac or chronic lung diseases.
- Smokers and alcoholic.

All patients were subjected to the following:

- Full history and thorough clinical examinations.
- Complete blood count.
- Liver function tests
- Kidney function tests.
- Serum alpha-fetoprotein.
- Child-Turcotte-Pugh (CTP) classification for each patient according to serum albumin, serum bilirubin, ascites, history of encephalopathy and prothrombin time.
- Abdominal ultrasound.
- Upper GIT endoscopy, using Pentax Videoscopy.
- Chest X-ray and high resolution CT chest with contrast on the day just before endoscopy and within 48 h post procedure in both groups [10].
- ABGs (RAPIDLab348EX) and spirometry (winspiroPRO5.0.0) were done 6 h before and 2 days after GIT endoscopy in both groups [11–13].

G1 was further divided randomly into 2 subgroups : Group 1a (G1a) and group 1b (G1b) as follow:

G1a: Subjected to IS (three-ball, flow-measuring device Plasti-med THREE BALL) for 2 days [14] then re-measurement of the same parameters. IS (sustained maximal inspiration), the patient inhales at a predetermined flow and sustains the inflation for at least 5 s. The patient is instructed to hold the spirometer in an upright position, exhale normally, and then place the lips tightly around the mouthpiece. The next step is a slow inhalation to raise the ball (flow-oriented) in the chamber to the set target. At maximum inhalation, the mouthpiece is removed, followed by a breath-hold and normal