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Can Variceal Band Ligation (VBL) Improve MELD Score for patients awaiting for liver transplantation?

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Background: Esophago-gastric varices are abnormal distended veins usually seen in the esophagus (esophageal varices) and less commonly in the stomach (gastric varices) or in other sites (ectopic varices), bleeding such varices prior to liver transplantation may increase the MELD associated – co-morbidities and even mortalities, hence Liver operation may cancelled in different situations, Nevertheless (VBL) should be optimized critically to improve overall success. **Aim**: Evaluated prophylactic (VBL) may have a beneficial role improving MELD score for those awaiting for Liver Transplantation.
Methods: prospectively 70 patients; 53 male and 17 female awaiting for liver transplantation aged (18 to 63) year- old (MELD score ranged between 16 to 38, presented with esophageal/ gastric varices with different grades, VBL was done as primary prophylaxis and comparative MELD score was calculated at the time of VBL and 2 weeks further on. Children was excluded from the study, additionally patients beyond Milan HCC criteria and those with contraindication for major surgery were excluded also.
Results: MELD score improved post VBL without reported complications, additionally VBL as a primary prophylaxis was a corner stone procedure saving those with large varices against bleeding may affect the overall operation prognosis, Mean, Median and SD before and after VBL was; (18.9,19.2, 6.02) and (16.9,15.9,6.5) respectively.
Conclusion: Cirrhotic patients presented with large esophageal varices (LEVs) prepared for liver transplantation should receive variceal band ligation (VBL) prior to surgery, should decrease associated co-morbidities. MELD score have been improved totally post (VBL), but statistically showed no significant importance.

Keywords: MELD, VBL, Liver transplant, Endoscopy.

Abbreviations: EGD: Esophago-Gastro-Duodenoscopy**, ESLD**: End Stage Liver Disease **EVs:** Esophageal Varices, **LDLT:** living donor liver transplantation **MELD**: Model for End Stage Liver Disease, **TIPS:** Trans-jugular intrahepatic portosystemic shunt, **VBL**: Variceal Band Ligation**.**

I. Introduction

Many complications of portal hypertension related-advanced cirrhosis can be identified in patients awaiting for liver transplantation, include porto-systemic collaterals with the resulting variceal hemorrhage, ascites, hepato-renal syndrome type I and II, hepato-pulmonary syndrome and porto-systemic encephalopathy, that may affect the outcome success of such major transplant operation, nevertheless the most complex operation in the surgery [1-5]. Nevertheless, varices are present in almost all patients with cirrhosis on the waiting transplant list, they are the most feared and most lethal of cirrhosis related- complications. Therefore, all patients on the list should be screened for their risk of having or developing varices in order to attempt prophylaxis VBL.

However many reported such Variceal Band Ligation (VBL) related- complications such as developing ascites post VBL , infection and re-bleeding, affecting MELD, that why some hepatologists worldwide prefer medical therapy instead of Variceal Band Ligation (VBL) [6-10]. Accordingly we hypothesized to know if VBL improves or does not improve MELD prior to liver Transplantation.

2. Patients and Methods

Prospectively we followed 70 patients on the waiting list for liver transplantation; 70 patients; 53 male and 17 female aged between 18 to 63 years old, in the period from January 2012 till January 2015, all have MELD > 14; (16 to 38), in

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different centers across Egypt. MELD was evaluated according to Mayo Clinic internet website calculator according to the international equation; MELD = 3.7 [Log serum bilirubin (mg/dL)] + 11.2 [Log INR] + 9.6 [Log serum creatinine (mg/dL)] + 6.4 [11]. All patients reported in the study were Egyptians with criteria of End stage liver disease (ESLD) of post viral hepatitis (HCV or HBV), the most common indication for liver transplantation worldwide. Prophylaxis VBL was done for all of them, MELD was calculated before the Endoscopy and 2 weeks later on.

Patients presented with hematemesis, melena, encephalopathy, hepato-renal syndrome either Type I or Type II, extensive portal vein thrombosis and those with HCC were excluded from the study, because other co-morbidities may affect the MELD score significantly, additionally those beyond Milan criteria for liver transplantation were excluded from current study.

3. Statistical Analysis

All statistical analyses were performed using SPSS version 22 software for Microsoft Windows (Statistical Package for the Social Sciences; SPSS Inc., Chicago, IL). The descriptive data were summarized as frequencies, percentages and mean with standard deviations (SD). Chi-square test was applied for testing relationships on categorical variables. Difference were considered statistically significant when p-value <0.01. The models discriminatory ability was verified through the operational characteristic curve.

4. Results

The mean age for all patients included in the study was 54.6 years old, Table 1.

Calculation of MELD Score pre and Post VBL showed difference, however it was not statistically significant, Table 2, Figure; 1, 2.

However MELD improved in 43 patients; 61.9% and did not improve in 27 patients; 38.1%; Table 3, Figure 3.

There was no reported complications first 2 weeks post VBL.

Table (1) age and related statistics for patients included in the study.

Mean	54.60
Median	55.00
Std. Deviation	5.123
Minimum	18
Maximum	63

Table (2) showing pre and post VBL MELD differences.

	Mean	Median	Std. Deviation	Minimum	Maximum
Preband ligation MELD	18.888	19.200	6.0222	7.3	30.7
Postband ligation MELD	16.937	15.900	8.4212	6.5	37.7

P= 0.1

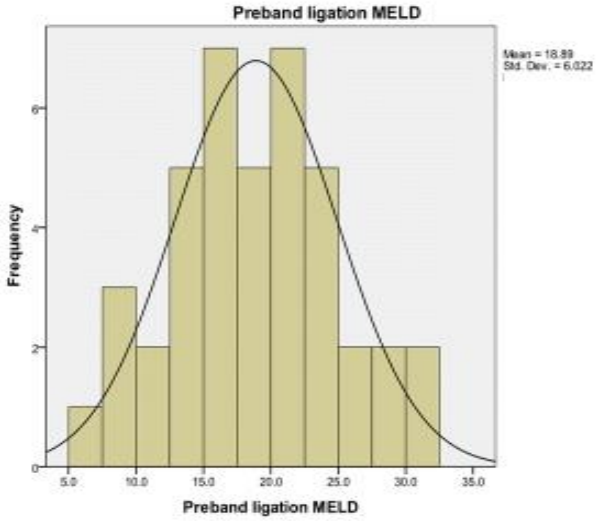

Figure (1) MELD Pre VBL.

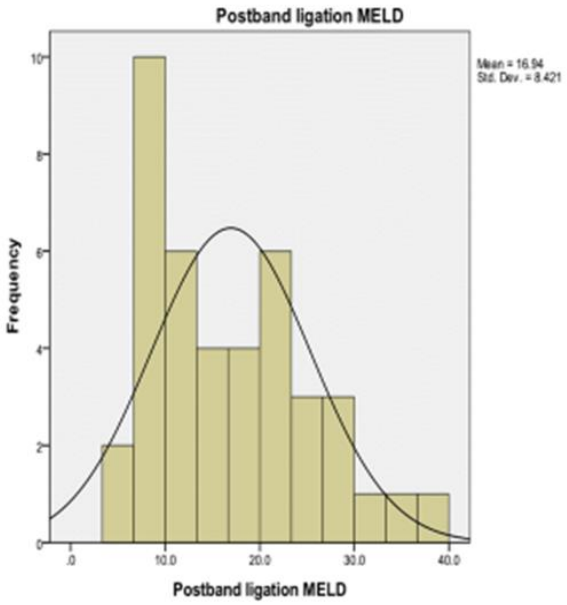

Figure (2) MELD post VBL

Table (3): MELD improvement Post VBL.

	Frequency	Percent
MELD score improved after band ligation	43	61.9
MELD score did not improve after band ligation	27	38.1
Total	70	100.0

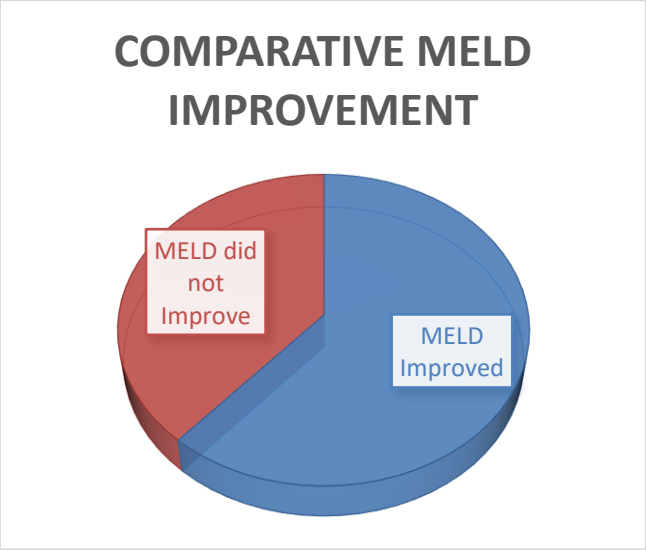

Figure (3): 38.1%; 27 patients did not show MELD improvement, while 61.9%; 43 patients showed MELD improvement.

5. Discussion

Liver Transplant is the only evident therapy for patients presented with liver cell failure. Patients on the waiting list for Liver transplant need intimate follow up, because progressive elevation MELD score may require early transplantation, a major and complex operation, may change their lives. The dreaded complication for patients on the waiting list for liver transplantation is portal hypertension with upper gastrointestinal bleeding. However bleeding esophageal varices may lead to death or even co-morbidities may change MELD score to a level make operation prognosis worsen accordingly. Esophageal varices are present in 60-80%, and in the absence of medical or / endoscopic prophylaxis 50% of Child-Pugh C patients with cirrhosis will suffer a variceal hemorrhage after 1 year, with reported mortality up to 20% [12].

VBL is widely used as a prophylaxis measure to prevent esophageal variceal bleeding in patients with advanced cirrhosis. However, the safety and efficacy of VBL in this setting have not been clearly established and still in a controversial debate due reported cases of re-bleeding and other complications [13]. The Model for End-Stage Liver Disease (MELD Score), is a scoring system for assessing the severity of chronic liver disease. It was initially developed to predict death within three months of surgery in patients who had undergone a trans-jugular intrahepatic portosystemic shunt (TIPS) procedure, and was subsequently found to be useful in determining prognosis and prioritizing for receipt of a liver transplant. This score is now used by the United Network for Organ Sharing (UNOS), USA and Euro-transplant for prioritizing allocation of liver transplants instead of the older Child-Pugh score [13,14].

Our prospective study was done initially to evaluate if there is a relationship between VBL and MELD and to consider in another point of view such complications related- VBL may affect the time of transplant operation and overall operation success, we have not reported any complications related to VBL in 70 Egyptian patients on the waiting list for living donor liver transplantation (LDLT) two weeks later on explained by good hands and professionals skills with very long experience who performed VBL. Additionally over all MELD improved but without statistical significant consideration; p=0,1, the situation we believed the safety of such effective procedure for all patients awaiting for liver transplantation, especially in areas or countries with a long waiting time.

However only 69.1% benefited from VBL; showed MELD score improvement, the overall eradication of EVs in all patients was a considerable benefit against variceal bleeding. The results of VBL in our patients awaiting for liver transplantation may reflect a more aggressive approach to banding and the fact that it was performed by gastroenterologists are highly experienced in such invasive procedure may initiate some reported complications, accordingly we encouraged the VBL procedure performed only by skilled physicians.

All our patients selected in such a study were confirmed having esophageal varices by 2D ultrasound, recently approved by ***uptodate®*** and other medical journals, the fact that we can predict EVs prior to VBL [15-18]. All Patients were on a waiting list for donation allocation selection because in Egypt there is only living donor allocation Program, a situation may make the waiting transplant list in Egypt longer than such allocation programs of both living donor and cadaveric system.

In a conclusion we suggest performing VBL for all patients awaiting for liver transplantation especially when longer waiting time, should improve MELD and decrease associated EVs- bleeding mortalities and morbidities, provided professional Gastroenterologists or Hepatologists should perform such worthy VBL procedure. Additionally Albumin correction before VBL may prevent developing ascites post VBL *(Not yet published data).*

6. Limitation of the study

The study was performed in Egypt where the highest HCV incidence worldwide, hence all patients were HCV, HBV or

combined viral hepatitis, hence other studies may show different results according to different liver diseases.

References

[1] Garcia-Tsao G, Sanyal AJ, Grace ND, Carey WD, for the Practice Guidelines Committee of the American Association for the Study of Liver Diseases and the Practice Parameters Committee of the American College of Gastroenterology. Prevention and management of gastroesophageal varices and variceal hemorrhage in cirrhosis. Am J Gastroenterol 2007; 102: 2086–2102.

[2] D'Amico G, Pagliaro L, Bosch J. Pharmacological treatment of portal hypertension: an evidence-based approach. Semin Liver Dis 1999; 19: 475–505.

[3] Chen W, Nikolova D, Frederiksen SL, Gluud C. Beta-blockers reduce mortality in cirrhotic patients with oesophageal varices who have never bled (Cochrane review). J Hepatol 2004; 40(suppl 1): 67

[4] Garcia-Tsao G, Grace ND, Groszmann RJ, Conn HO, Bermann MM, Patrick MJ, et al. Short-term effects of propranolol on portal venous pressure. Hepatology 1986; 6: 101–106.

[5] Schepke M, Kleber G, Nurnberg D, Willert J, Koch L, Veltzke-Schlieker W, et al. Ligation versus propranolol for the primary prophylaxis of variceal bleeding in cirrhosis. Hepatology 2004; 40: 65–72.

[6] Imperiale, TF, Chalasani, N. A meta-analysis of endoscopic variceal ligation for primary prophylaxis of esophageal variceal bleeding. Hepatology 2001; 33: 802. Wiley Online Library | PubMed | CAS | Web of Science® Times Cited: 115

[7] Norberto L, Polese L, Cillo U, Grigoletto F, Burroughs AK, Neri D, et al. A randomized study comparing ligation with propranolol for primary prophylaxis of variceal bleeding in candidates for liver transplantation. Liver Transpl 2007; 13: 1272–1278.

[8] Jutabha R, Jensen DM, Martin P, Savides T, Han SH, Gornbein J. Randomized study comparing banding and propranolol to prevent initial variceal hemorrhage in cirrhotics with high-risk esophageal varices. Gastroenterology 2005; 128: 870–881.

[9] Conn HO. Ammonia tolerance in the diagnosis of esophageal varices: a comparison of endoscopic, radiologic and biochemical techniques. J Lab Clin Med 1967; 70: 442–451.

[10] North Italian Endoscopic Club for the Study and Treatment of Esophageal Varices. Prediction of the first variceal hemorrhage in patients with cirrhosis of the liver and esophageal varices: a prospective multicenter study. N Engl J Med 1988; 319: 983–989.

[11] Mayo MELD Score http://www.mayoclinic.org/medical-professionals/model-end-stage-liver-disease/meld-score-90-day-mortality-rate-alcoholic-hepatitis

[12] Lim EJ, Gow PJ, Angus PW. Endoscopic variceal ligation for primary prophylaxis of esophageal variceal hemorrhage in pre-liver transplant patients. Liver Transpl. 2009 Nov; 15(11):1508-13

[13] Pagliaro L, D'Amico G, Pasta L, Politi F, Vizzini G, Traina M, et al. Portal hypertension in cirrhosis: natural history. In: BoschJ, GroszmannRJ. Portal Hypertension: Pathophysiology and Treatment. Oxford, United Kingdom: Blackwell Scientific; 1994: 72–14.Terblanche J, Burroughs AK and Hobbs RE. Controversies in the management of bleeding esophageal varices. N. Engl. J. Med; 1989, 32: 1393-1398, 1469-1475.

[14] Thabut D and Bernard-Chabert B. Management of acute bleeding from portal hypertension. Best Pract Res Clin Gastroenterol; 2007, 21: p19-29.2.

[15] Arun J Sanyal. Primary and pre-primary prophylaxis against variceal hemorrhage in patients with cirrhosis. UpToDate, current through: Nov 2016.

[16] Abd Elrazek AE, Bilasy SE, Elbanna AE, et al. Prior to the oral therapy,what do we know about HCV-4 in Egypt: a randomized survey of prevalence and risks using data mining computed analysis. Medicine (Baltimore) 2014;93:e204.

[17] Abd El Razek MA, Mahfouz H, Afify M, et al. Detection of risky esophageal varices by 2D U/S: when to perform endoscopy. AmJMed Sci 2014;347:28–33.

[18] Abd Elrazek AE, Eid KA, El-Sherif AE, et al. Al UM screening esophagus during routine U/S; medical and cost benefits. Eur J Gastroenterol Hepatol 2015;27:8–12.