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Modern Treatment of Mallory-Weiss Syndrome

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Abstract: The purpose of this study is to investigate the effectiveness of endoscopic hemostasis methods, in particular electrocoagulation in Mallory-Weiss syndrome. The analysis of the treatment of 71 patients who were divided into two groups including the group with the use of electrocoagulation, and the other one with an injection of 0.01% adrenaline were studied from 2015 to 2020. Results of the study found out that ruptures and bleeding in the abdominal part of the esophagus characterized the fact that there is the largest amount of bleeding among all patients, as well as in this part of the esophagus, severe bleeding is observed less often than in other departments, and a slight degree of blood loss is usual occurrence respectively. As a result, the use of endoscopic methods of hemostasis contributed to a decrease in surgical intervention, and improved differential diagnosis in Mallory-Weiss syndrome.

Keywords: Mallory–Weiss syndrome; bleeding; endoscopic methods of hemostasis; electrocoagulation, alcohol intoxication.

Introduction

The incidence of Mallory-Weiss syndrome (MWS) has increased by almost 2–2.5 times in recent decades, which is due not only to the improvement of endoscopic diagnostic methods, but also to an increase in alcohol consumption among the population [1, 2].

The number of recurrent bleeding in MWS reaches 6-42%, postoperative mortality is 10-17%, and overall mortality is 11.8-4.8% [1, 3, 4]. If there is a recurrence, then the use of the combined method of endoscopic hemostasis gave a good result [5]. MWS ranks first among non-ulcer gastroduodenal bleeding and remains one of the unsolved problems of emergency surgery, given their frequency, high mortality and insufficient effectiveness of existing methods of treatment [6] MWS is an acute surgical pathology caused by a rupture or longitudinal crack in the wall of the esophagus and stomach. The disease mainly occurs in men aged 45-60 years who consume excessive amounts of alcohol [3]. And the pathology in men is based on indomitable vomiting, which leads to rupture of the pathologically altered mucous membrane of the proximal stomach. And diseases such as gastritis, cholecystitis, and tumors lead to changes in the gastric mucosa. [7, 8, 9].

This disease was first described by Georg H. Quinke in 1879 [10]. G.K. Mallory and S. Weiss themselves attached decisive importance in the etiology of MWS to previous alcohol intoxication [11, 12], currently alcohol abuse in this group of patients is observed in 50-82.5% of cases [1, 3, 10, 13]. The main influence of alcohol on the occurrence of ruptures of the esophageal-gastric junction is that it acts as a factor that causes vomiting [10, 14].

Ethyl alcohol affects the mucosa of the esophagus and stomach by increasing the retrodiffusion of hydrogen ions (H+), reducing its protective properties [2]. In addition, alcohol intoxication disrupts the motor activity of the esophagus and normal pressure in the sphincter area [1, 4, 15].

Purpose of the study

To is to study the effectiveness of the use of endoscopic methods of hemostasis, in particular, electrocoagulation in MWS.

Materials and methods

The study included 71 patients who were hospitalized in the Khorezm branch of the Republican ScientificCenter for Urgent Medical Aid for MWS in the period from 2015 to 2020. All patients were transported by emergency medical service. During the study, the patients were divided into two groups: 1) the main group, in patients of this group, the endoscopic method of electrocoagulation was used for treatment, the main group included 43 (60%) patients; 2) the control group, in patients of this group, endoscopic injection with a solution of 0.01% adrenaline was used, the control group included 28 (40%) patients.

The study used 2 methods of endoscopic hemostasis: 1) thermal; 2) injection.

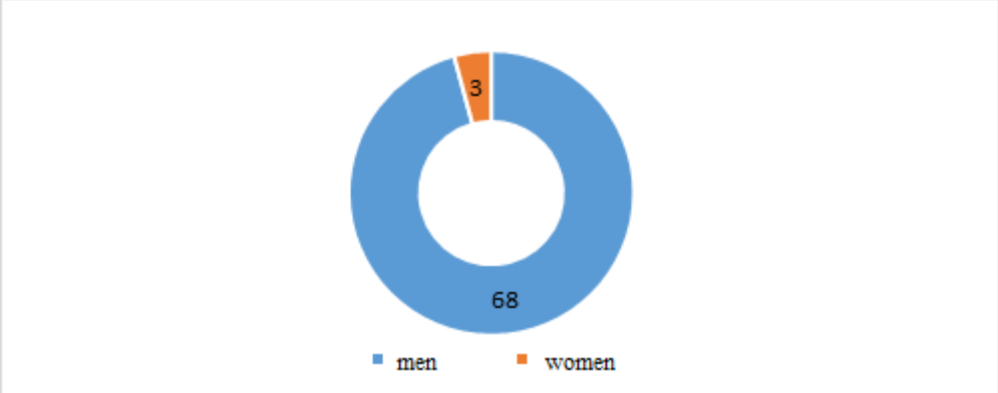
Fatalities were not added to the study.

Informed consent was signed by all patients or their relatives prior to endoscopic procedures.

For statistical data processing, the Microsoft 2017 software package, in particular Excel, was used.

These results are considered statistically significant at p-values <0.05. Mean values are defined as the mean value of Med (IQR), M±SD.

Of all patients, 68 (95%) were male and only 3 (5%) were female (Figure 1).



Picture 1. Distribution of patients by gender

The average age of men was 55-56 years, and the average of females was 67-68 years. When distributing patients by place of residence, it turned out that 74% live in rural areas, and only 26% in cities (Fig. 2).

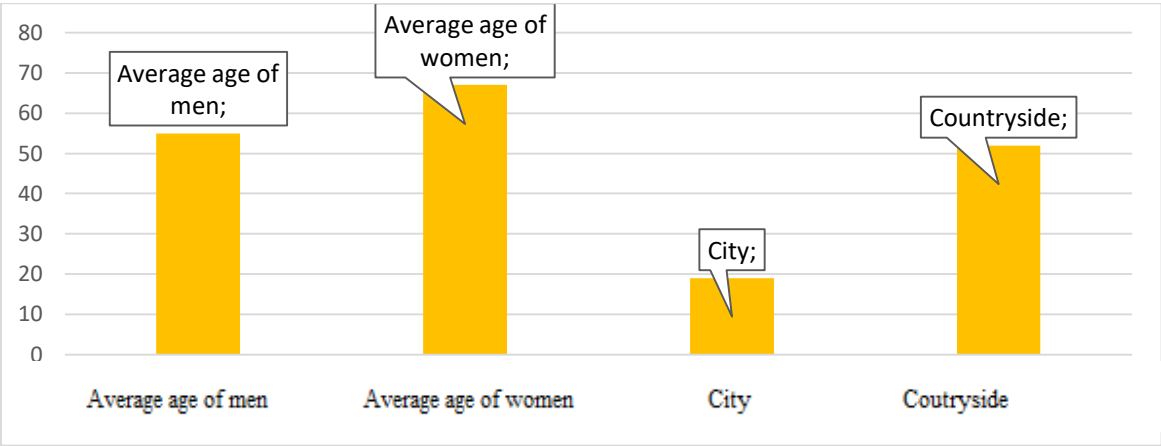


Figure 2. Average age and location of patients

When distributing reviewers by type of activity, it turned out that 52 (73%) of them were persons of physical labor, 15 (21%) patients were persons with mixed forms of work, and the remaining 4 (6%) were persons of exclusively mental labor (Fig. 3).).

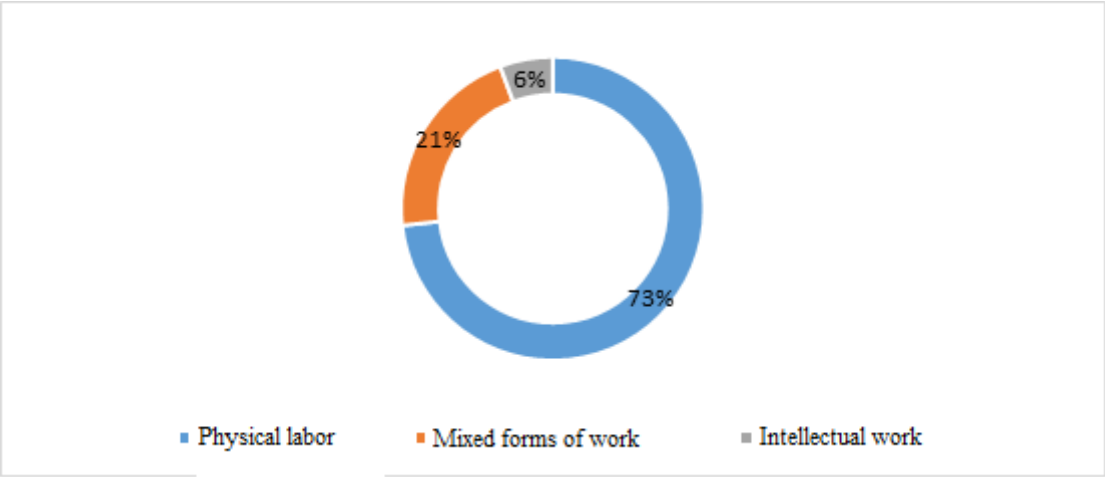


Figure 3. Activities of reviewers

Within the patients, only 3 (4%) were urgently operated on by traditional methods, due to the failure of conservative treatment, with signs of unstable hemodynamics and severe bleeding.

Endoscopic interventions were performed up to 3 hours after hospitalization. All patients were admitted to the intensive care unit to prepare the upper gastrointestinal tract for endoscopic procedures. In the intensive care unit, sedation and leveling the effects of alcohol intoxication were performed.

All manipulations were performed under anesthesia, under the supervision of a resuscitator.

During the initial endoscopic examination, hemorrhage was found in 56 (78%). And almost all of these patients had a stage of severe alcohol intoxication. Endoscopic manipulations lasted from 15 to 35 minutes.

When studying the presence of favorable backgrounds for the development of the Mallory-Weiss syndrome leading to varicose veins of the esophagus and stomach, it was found that men lead in almost all aspects, and are more prone to the development of MWS (Figure 1).

Almost all patients were brought by the emergency service in a state of intoxication. And only 11 patients were delivered in a sober state, causing lethargy, hemoptysis (Figure. 4).

When determining the presence of bad habits among all reviewers, it was found that 66 (92%) patients drink alcoholic beverages in different volumes and at different intervals, and only 4 (8%) of all patients do not drink alcoholic beverages. All females drink alcohol regularly in average amounts, and

among males this indicator was higher and more diverse among the criteria: regularly in small quantities 4% - this indicator suggests that drinking even in small quantities regularly is not a factor high risk of developing MWS; regularly in average quantities 26%;

regularly in large quantities 58% the largest proportion of patients falls on the last two groups, which means the use of alcoholic beverages regularly in all quantities, especially in large quantities leads to the development of Mallory-Weiss syndrome (Table 4).

Frequency and amount of consumption of alcoholic products among reviewers	Females %	Males %
Regularly in small quantities	0	4
Regularly in average quantities	100	26
Regularly in big quantities	0	58
Periodically in small quantities	0	0
Periodically in average quantities	0	0
Periodically in big quantities	0	4
Non alcoholic drinker	0	8

Table 4. Frequency and amount of consumption of alcoholic products among reviewers

In the definition of smoking tobacco products had a slightly different result. All females did not use tobacco products. In men, 27 (40%) men do not use tobacco products, 13 (19%) of them use up to 5 cigarettes per day, 16 (24%) use up to 11 cigarettes per day, and 12 (17%) men use more than 11 cigarettes a day.

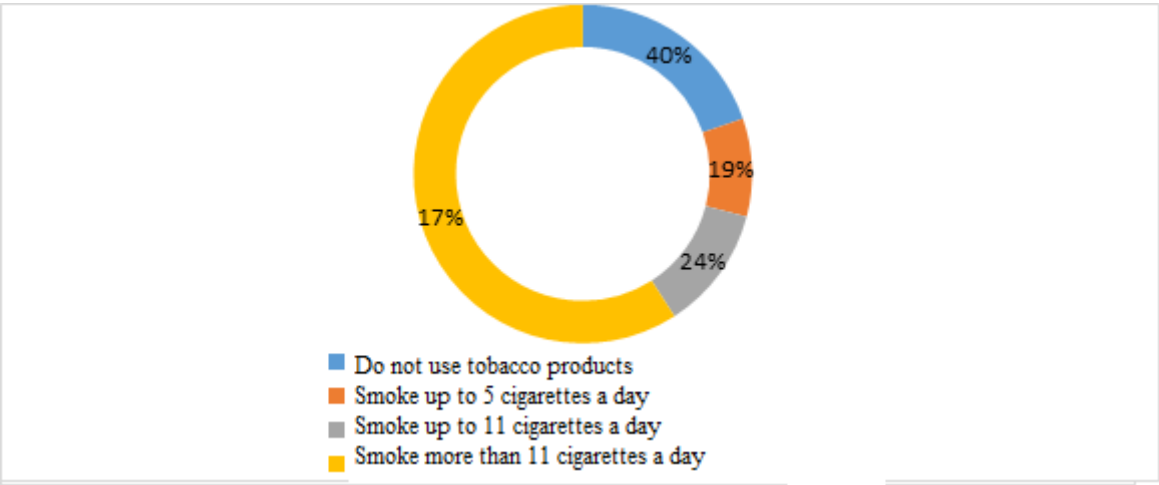


Figure 5. Distribution of men by the degree of tobacco smoking, %

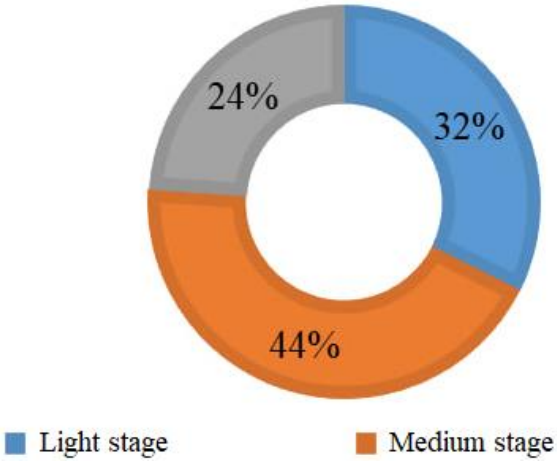
When dividing patients according to the degree of blood loss, they were divided into 3 groups: 1) mild degree; 2) average degree; 3) severe degree

With mild and moderate degrees of blood loss, it was advisable to use conservative methods of treatment of endoscopic hemostasis. With a severe degree of hemorrhage, the use of endoscopic hemostasis is not sufficient for complete and stable hemostasis, so we had to resort to the traditional method in the form of surgery in 3 (4%) patients.

The group with a mild degree included 23 (32%) patients, it is worth noting that in this group there were all 3 female representatives, which shows that women are not predisposed to MWS.

The group of moderate blood loss included 31 (44%) patients, and all of them were males in the age categories of 41-50 and 51-60 years, with the abuse of alcoholic beverages.

The group with severe blood loss included 17 (24%) patients, and all of them were males over 60 years of age. They had the longest and highest levels of alcohol abuse (Fig. 6).



Picture 6. Number of patients according to the degree of blood loss

Results and discussions

When studying the localization of bleeding, the following results were obtained. Tears and bleeding in the abdominal part of the esophagus are characteristic in that there is the largest amount of bleeding among all patients, and also in this part of the esophagus, heavy bleeding is observed less frequently than in other parts, and a mild degree of blood loss prevails. Its localization gives an advantage in the diagnosis of bleeding, as well as in its treatment with conservative methods (endo-electrocoagulation).

In the cardial esophagus, there is an average amount of bleeding among all patients, and they predominantly have an average degree of bleeding. Its localization also provides an advantage in the diagnosis of bleeding, as well as in the treatment of its conservative methods. With MWS localized in the lesser and greater curvature of the stomach and the pyloric part of the stomach, there is a predominantly severe degree of bleeding, as well as some difficulties in the diagnosis and treatment with conservative methods of treatment due to its localization. With large-scale ruptures of the gastric mucosa and a severe degree of bleeding, one has to resort to traditional methods. These cases were rare in our study (n=3 (4%)).

When examining the size and depth of the gap, the following data were obtained:

From materials that the size criteria - length, width and depth of the gap are interconnected, there are also exceptions when comparing various factors, that is, length, width and depth may not be related to each other

Based on these criteria as the length, width and depth of the rupture according to the clinical and anatomical signs of MWS according to the classification of S.V. Timerbulatov, our patients were distributed as follows:

Stage I MWS included 12% (n=9) of patients; n=3) patients.

The use of endoscopic injection with a solution of 0.01% adrenaline is relevant only in the first stage of MWS.

In our study, only 2 methods of endoscopic hemostasis were used: 1) electro-endoscopic hemostasis; 2) injection hemostasis with a solution of 0.01% adrenaline.

Electro-endoscopic hemostasis was used in the main group. In 93% (n=40) of patients from the main group, the method of electro-endoscopic hemostasis was effectively used, only 7% (n=3) of patients with MWS were subjected to the traditional method of treatment in the form of surgery. In all other cases, the electrocoagulation method of hemostasis was completely effective, without rebleeding, regardless of the stage of MWS.

In a detailed study of the data of these 3 patients who underwent the traditional method of treatment, the following results were obtained. All of these patients were male. Their negligence towards their health led to the progression of MWS to stage IV, against the background of a long period of alcohol intoxication. Two of them belonged to the age group of 61-70 years, and only 1 belonged to the age group of 51-60 years. It turned out that all these 3 patients lived in rural areas, with an underdeveloped healthcare structure. 2 (66.6%) had Gastro esophagial reflux disease and 1 had gastric ulcer.

In a detailed study of the frequency and volume of alcohol consumption among these 3 patients, it turned out that 2 (66.6%) drink alcoholic beverages regularly in large quantities, and 1 (33.3%) consume alcoholic beverages regularly in an average amount.

When studying the localization of stage IV rupture, in the same 3 patients, it was found that in 2 (66.6%) patients the rupture was in the cardial part of the esophagus, and in 1 (33.3%) the rupture was in the cardial part of the stomach. These are the parts of the gastrointestinal tract that take the most pressure when vomiting is continuous.

When studying the dimensions of the gap, as length, width and depth, these three patients obtained the following results; in all patients, the rupture was localized in the cardial esophagus, had a length of more than 50 mm, the width of the rupture was more than 9 mm, and its depth was exactly 8 mm; All three of these patients had severe hemorrhage. Conservative treatment in the form of endoscopic hemostasis by electrocoagulation, in these 3 patients, contributed only to coagulation of small and medium-sized blood vessels, and this method was ineffective when restoring the integrity of vessels, tissues and blood circulation in tissues, thus it was necessary to resort to the traditional method of treating MWS. In the control group, injection hemostasis was used with a solution of 0.01% adrenaline solution. In this group, there were 28 patients with different stages of MWS. Effective treatment with this method was observed only in 9 (32%) patients, 7 of which were patients with stage I MWS, and the remaining 2 patients with stage II. Only 2 patients with stage II MWS managed to achieve complete hemostasis, while the rest had rebleeding. And in patients with stage III and IV, this method was absolutely ineffective.

Conclusions

1. In our study, it was repeatedly proved that age-related changes are the main factors that contribute to the rupture of the mucous layer, the older the person, the easier the gastric mucosa is damaged.

2. The use of alcoholic beverages is a derivative factor in the rupture of the mucous layer in MWS, when consumed regularly in medium and large volumes.

3. The use of endoscopic methods of hemostasis contributed to a reduction in surgical intervention, and improved differential diagnosis in MWS.

4. In all patients with stage III and IV MWS, the aggravating factor was prolonged and severe alcohol intoxication, and all stage IV patients had, in addition to derivative factors, also pathological risk factors such as Gastro esophagial reflux disease and stomach ulcers.

5. At stage IV of MWS, ruptures occur in the cardiac esophagus and stomach (up to 66.6%). These are the parts of the gastrointestinal tract that take the most pressure when vomiting is continuous. Also, the cardial esophagus and the cardial part of the stomach are most susceptible to the action of acidity in gastroesophageal reflux disease, such as narrowing of the lumen of the organ, scarring and tissue sclerosis.

6. Endoscopic method of hemostasis electrocoagulation allows to achieve stable hemostasis in Mallory-Weiss syndrome, and reduce the number of rebleeds. It is also more relevant as most patients had stages of MWS above stage 1.

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