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SPONTANEOUS HEMORRHAGE IN SEVERE FORMS OF COVID 19 INFECTIONS

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ABSTRACT

Background: This research paper is an expression of a desire to view COVID 19 from the perspective of a spontaneous hemorrhage induced on different organ systems. Introduction of a stratified approach to the problem of hemorrhage has become an imperative in medical treatment.

Aim: To determine the real figure of spontaneous hemorrhage cases in severe forms of infections caused by Covid 19.

Material and methods: The research included 745 patients that suffered from severe forms of infections caused by Covid 19 who were treated in a Respiratory clinic in Tuzla University Clinical Center during 2020 and 2021. The spontaneous hemorrhage was determined on the grounds of laboratory parameters of blood counts and CRP, hemodynamic monitoring of TA and pulse, and CT imagining diagnostic technique.

Results: The study presents information about the medical treatment outcome in the case of 5 patients (0,67%) who experienced spontaneous hemorrhage as a part of Covid 19 infection in relation to the total number of 745 patients who were treated during that period in the Respiratory clinic as Covid patients with severe forms of infection. Out of 5 patients who acquired spontaneous hemorrhage 3 were operated. For 4 patients the outcome was lethal. One of the female patients who was in the group of those who were not operated and who had undergone a conservative treatment has survived. In our group of analyzed patients two patients suffered from the hematoma of the front abdominal wall, two had retroperitoneal hematoma and one patient acquired hemorrhage in the abdomen and thoracic with the developing DIC.

Conclusion: Relatively low percentage of cases developing spontaneous hemorrhage 5 (0, 67%) but relatively high mortality rate in the cases where it did occur, 4 out of 5 monitored patients, requires certain suggestions that are being presented in this study as to how to approach the cases of spontaneous hemorrhage in the severe forms of Covid 19 infections in more consistent manner in order to improve the outcome of the medical treatment of these cases.

Key words: Covid 19, abdominal, spontaneous hemorrhage

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INTRODUCTION

Covid 19 is a pandemic viral disease as well as multidimensional global issue which we will have to live with in the future. Despite a great deal of information that we have acquired about this pestilence so far, we can freely state that human population and SARS CoV 2 virus are still getting to know each other. A lot has been said so far about thromboembolic aspect of this disease yet very little about the spontaneous hemorrhage that can be caused on different organ systems and that can occur during the medical treatment of Covid patients. Research studies, that have been performed so far, show that thromboembolic cases are present in 21% of patients with the mortality rate of 74% in Covid patients [1-5]. Certain studies performed in this field show that total incidence rate of spontaneous hemorrhage in the cases of Covid 19 patients is 4, 8% i.e. 7, 8% and with the rate of massive hemorrhage 2, 3%. Published studies have monitored smaller groups of patients with this complication [6-8]. There are few ongoing studies, REMAP-CAP, ATTACC and ACTIV-4 which are focused on the role of the administration of anticoagulants with patients suffering from severe forms of COVID-19 infection. This study, however, has been performed in order to determine the incidence rate of spontaneous hemorrhage in severe cases of Covid infections, modality of surgical treatment and the treatment outcome.

PATIENTS AND METHODS

Cohort retrospective study of 745 hospitalized patients who were treated in the Respiratory center of Tuzla University Clinical Center during 2020 and 2021 due to severe respiratory form of Covid 19 has been performed. All analyzed patients had certain form of mechanical ventilation support due to severe forms of respiratory Sars CoV 2 infections. Spontaneous hemorrhage was confirmed in 5 cases (0, 67%) of patients, four female and one male patient. The youngest patient was 53 years old while all other patients were 60 and over. The aim of this research was to determine the number of spontaneous hemorrhage in the severe cases of Covid 19 infection and to analyze the outcome of their treatment.

RESULTS

All 5 patients that have acquired spontaneous hemorrhage had severe form of Covid 19 infection with bilateral interstitial pneumonia and had certain form of mechanical ventilation support. All patients had at least one comorbidity mostly arterial hypertension. No correlation was determined between the occurrence of hemorrhage and trauma, iatrogenic injuries or any other "outer" cause that could induce hemorrhage.

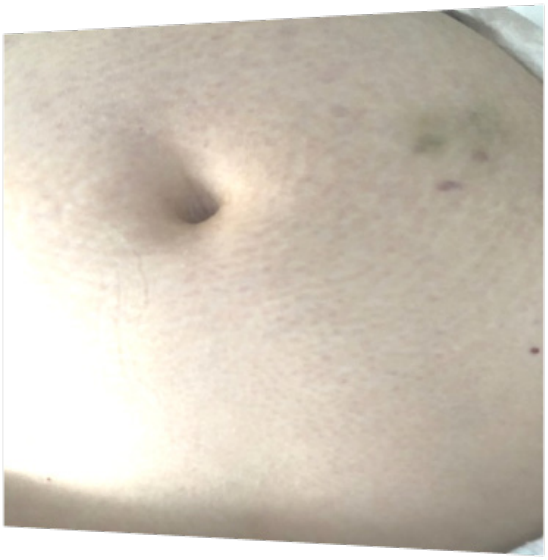
Out of five analyzed patients two had spontaneous rupture of rectus abdominis muscle, two patients had combination of intra-abdominal and retroperitoneal hemorrhage, while one patient experienced intra-abdominal and intrathoracic hemorrhage that later developed into DIC. Spontaneous hemorrhage occurred mainly between the seventh and ninth day of medical treatment in the Respiratory center in Tuzla University Clinical Center. All patients who were directed to surgical treatment were prior to the transfer to Surgical clinic, i.e. Intensive care unit of the Anesthesiology and Reanimation Clinic of the University Clinical Center Tuzla, retested and their PCR tests were negative.

Chart 1. Division of spontaneous hemorrhage cases depending on localization

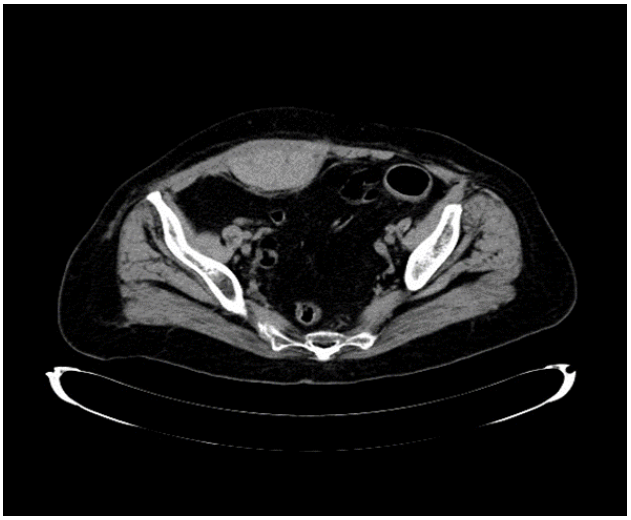
The location of hemorrhage	Number of patients
Front abdominal wall	2 patients
Retroperitoneal	2 patients
Abdomen and thorax DIC	1 patient

Indications for the necessity of surgical treatment were: continuous drops in lab reports of Hgb, Htc, blood counts, CRP values exceeding with the collection of blood samples with no signs of regression that had been confirmed with CT imagining findings. From this group consisting of 5 patients with the cases of hemorrhage three patients were operated and two had undergone conservative treatment. Four patients had lethal outcome. All patients with lethal outcome experienced postoperative further progression of lungs findings. Three patients from the operated group with lethal outcome did not experience postoperative hemorrhage. The patient with DIC on ECMO support experienced global irreversible coagulation dysfunction and this outcome was to be expected due to the gravity of his Covid caused infection and complications occurring afterwards. Only one female patient survived who was treated in the conservative manner and who experienced retroperitoneal hemorrhage with no progression while her hemodynamic status was stable throughout the whole period of treatment.

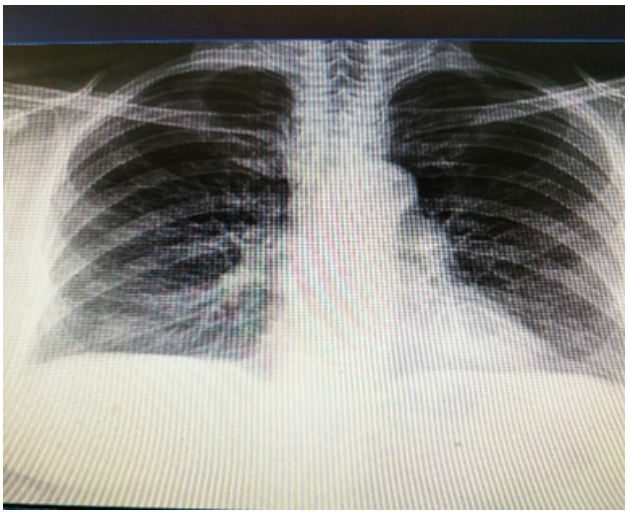
In the case of two patients with rectus abdominis muscle rupture the incision of the front abdominal wall was performed with the evacuation of hema, lavage and hemostasis. Operative incisions were not sutured. After the operation compressions were left for 24 hours in the bottom area of the surgical wound as a homeostatic packing. The third operated patient had undergone laparotomy due to the dominant retroperitoneal and smaller intra-abdominal hematoma. The evacuation of hematoma was done with substantial lavage, hemostasis, drainage and temporary packing with compressions in the retroperitoneal area.



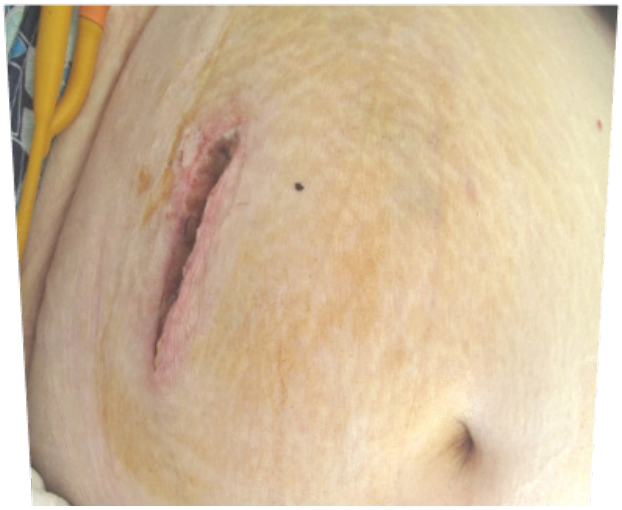
Picture 1. Hematoma of the front abdominal



Picture 2. CT scan of hematoma of the front wall of our operated patient abdominal wall of our operated patient



Picture 3. Lung X-ray prior to operation,



Picture 4. Operative incision after the Persistent infiltration of lungs evacuation of hematoma

DISCUSSION

When considering Covid 19 infection and tendency of patients to develop spontaneous hemorrhage the mechanism of incurrence has not been yet clarified within all elements. We can only say that we are talking about a cascade of possible reasons that individually or as a group cause the incurrence of bleeding. Coagulopathy, "Cytokine storm", systematic inflammation, low platelets counts, endotheliitis and endothelial dysfunction, a cough associated with pneumonia that changes intrathocacic and intra-abdominal pressure are only some of the reasons that have been mentioned in textbooks as possible reasons for initiation of hemorrhage [9-13] .

In the group of patients with serious forms of hemorrhage caused by Covid 19 infection that we have analyzed so far, a very small number of patients 0, 67% (5) have been registered as such when compared with the total number of treated patients within the Respiratory center of Tuzla University Clinical Center, (745 patients), during the monitoring period of 16 months in 2020 and 2021. However, a high mortality rate definitely requires more sensible approach towards this issue. Four out of five patients experienced lethal outcome. The actual number of "smaller scale" hemorrhages that occurred with treated patients that were less intensive and did not cause serious clinical repercussions has not been determined nor viewed. All of these mentioned events and activities must be placed in the context of a new paradigm of our work, new conditions and new disease with limited material and human resources. These issues must be observed in the sense of overburdened health system and work that needs to be done in new and different conditions of so called "red zone". With realistic prognosis that this pandemic will prevail through mutated forms of viral infection, we consider that the incurrence of spontaneous hemorrhage will be more and more evident and will require clear guidance and response as to "what to do with those patients", how to choose the best approach, how to detect high risk patients and provide better treatment strategy.

We consider that it is important to make few steps in order to achieve better results and outcomes in the treatment of patients with spontaneous hemorrhage caused by Covid 19 infection.

It is important to select the patients that face absolute risk of hemorrhage and for whom anticoagulation therapy could cause more damage than benefit; such are patients with DIC, thrombocytopenia or previous inclination to bleeding.

We should keep in mind those patients suffering from the conditions of intracranial and genitourinary hemorragia, epistaxis and tracheostomy. We must first detect such patients by taking a very detailed case history and with detailed insight into previous medical documentation and furthermore during the treatment, we should have very sensitive and personalized approach that will take in consideration many variables. The patient management for such patients, due to these unclear issues, should be set up by the most multidisciplinary educated medical workers. I stress once more that the real number of small scale or hidden hemorrhages we can only tend to assume.

It is also important to mention that several forms of revised and agreed protocols for the medical treatment in the cases of Covid 19 have been set up. What is common for all those protocols is the administration of anticoagulants in almost all severe and slightly less severe cases of COVID 19 infections since it has been proven that they reduce the mortality rate [12]. However, the dosage, the manner of administration and therapy length with anticoagulants still present the area that is being discussed and has not been yet completely defined and has no clear guidance. Furthermore, the administration of anticoagulants carries a certain degree of risk with itself. This risk is a possibility for a patient to be exposed to undesirable progression of illness in the sense of acquiring a thrombosis or hemorragia. The chosen nonselective approach to the administration of anticoagulants with serious and slightly less serious cases out of two possible scenarios in progressions chooses the one that leaves lesser consequences or results in lower mortality rate. This is the issue that

we have to approach in more profiled manner, since the end of pandemic is not visible yet. Having in mind capital variables, nonselective approach to the administration of anticoagulants should be replaced with more individualized and modeled approach in the case of patients who face a greater risk of possible incidence of hemorrhage.

If we overview published studies on the treatment of patients with evident hemorrhage, we will notice that the Italian authors have achieved some promising results in application of the early radiological interventions in relation to the embolization of bleeding blood vessels that greatly minimizes the mortality rate and improves the outcome of medical treatments [14-19].

There is no clear consensus in the regard of retroperitoneal hematoma. All researches and logical thinking lead in the direction of early detection and swift intervention that would result in better outcome and treatment in general of the patients with retroperitoneal hematoma[20-22] . Early radiological intervention in the sense of embolization, reduction of hematoma, shortens the compression period onto surrounding tissue. All this is possible to achieve in the institutions that have such procedures set up, meaning that have teams of radiologists who are on disposal for 24 hours, the medical centers that apply such procedures when necessary, regardless of pandemic conditions. We can only assume that our efficiency in the medical treatment of patients with spontaneous hemorrhage as a consequence of Covid 19 infection would be much better if algorithm of treatment considered embolization performed by a radiologist as a first line of action. Current conditions in Tuzla Clinical Medical Center in the sense of urgent radiological procedures in the conditions of intracranial hemorrhage are such that there is always a team of radiologists ready to perform the required procedure at any time during 24 hours. However we do not have such teams nor set procedures for thorax and abdomen, i. e. other organ systems and in the cases of non Covid patients. This realistic view of the situation should be put into the context of a new, very dangerous viral epidemic that is currently "on the scene" and in which case, an experienced, emergency radiologist under special, aggravated circumstances, in so called "red emergency rooms" could, with a responding team (that would consist of an anesthesiologist, radiologist and medical technician) perform radiological procedures. The improvement of our treatment of patients with spontaneous hemorrhage as a consequence of Covid 19 infection will improve once we completely introduce everything of the aforesaid.

CONCLUSION

We have come to the conclusion that in the cascade of possible and achievable measures for the improvement of the results in the treatment of the patients suffering from the spontaneous hemorrhage in the cases of Covid 19 infection it is necessary to:

Apply attentive and stratified approach in the evaluation of patients who are facing a risk of possible occurrence of hemorragia.

Initiate multidisciplinary and personalized treatment due to the lack of clear guidance and directions.

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