



WHY LABORATORY RESULTS ARE SO IMPORTANT FOR ACCIDENT VICTIMS WITH BLEEDING SHOCK (HYPOVOLEMIC SHOCK)

After car accidents and other physical traumas, many patients die from loss of blood. Some of these deaths could be preventable - if patients with life-threatening bleeds were identified early and treated consistently. ¹ Read here how you can improve patient care with efficient laboratory diagnostics.

It is crucial for the survival of accident victims that heavy bleeding or coagulation disorders are quickly detected and treated. However, it is not always easy to estimate the extent of the bleeding with the naked eye, or purely on the basis of clinical factors. ²

Do not forget coagulation diagnostics!

The situation becomes even more life-threatening when severely injured people develop trauma-associated coagulopathy.³ Experts describe the coagulation disorder as a „problem of the first hour“. The causes are multifactorial: tissue damage, hypoperfusion, hemodilution, hypothermia, acidosis and inflammation all play a role.⁴ Around 1 in 4 severely injured people are affected. If the coagulation disorder is not detected and treated in time, the chances of survival decrease considerably.⁴

Guideline recommendation: You should determine these laboratory values

For this reason, the S3 guideline „Treatment of Polytrauma/Severely Injured Persons“ recommends that coagulation diagnostics be initiated immediately after the patient has been admitted to the trauma room. The following laboratory values should be measured immediately and repeatedly:⁵

- > Quick value
- > Activated partial thromboplastin time (aPTT)
- > Fibrinogen
- > Thrombocytes

Serum lactate and base deviation should be determined to estimate, and monitor, the extent of bleeding. Changes in lactate concentration also provide information on the prognosis and response of patients to therapy.² The determination of hemoglobin (Hb) and hematocrit (Hct) is also part of the basic diagnosis of trauma patients. Both values should be measured repeatedly as emergency-related fluid and erythrocyte substitution or intrinsic compensation mechanisms may result in Hb and Hct concentrations initially being within normal range despite heavy bleeding.²

In addition, the blood group should be determined so that the appropriate preparations can be provided in the event of a blood transfusion.⁵

Theory vs. practice: Laboratory results often take too long

What is recommended in theory, however, is often difficult to implement in everyday hospital life. The problem: Routine laboratory diagnostics take time, laboratory results are usually not available after just 30 or 40 minutes.⁴ For the physician, this means that he must make his therapy decision empirically, although some experts advise against starting a blood transfusion without the basis of laboratory diagnostics. The fact that the values are sometimes difficult to interpret adds to the difficulty.^{2,4}

According to experts, the quality of care for trauma victims could be improved by shortening the time between patients being admitted to hospitals and the availability of laboratory results.²



Faster laboratory diagnostics = faster therapy

One way of identifying coagulopathies earlier and thus accelerating therapy decisions is to use so-called viscoelastic tests such as thromboelastography and rotational thromboelastometry.⁵

Thromboelastography and rotational thromboelastometry

With these special bedside procedures available, the following parameters can be determined without time delay in addition to the coagulation time:⁵

- > Maximum Clot Firmness [MCF]
- > Clot Formation Time [CFT]
- > Clot Formation Rate [CFR]

However, these tests provide only limited information about platelet function, primary hemostasis and the intake of platelet inhibitors.⁵

Sources

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