**Prognostic Factors of Liver Injury in Polytraumatic Patients. Results from 895 Severe Abdominal Trauma Cases**

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**Abstract**

**Background and Aims.** Prognosis of multiple injured patients is mainly limited by severe haemorrhage. Although mechanisms of altered immune response have been intensively investigated, little is known about the relevance of liver trauma as an independent predictive outcome factor in these patients. **Methods.** 10,469 patients from the DGU Trauma Registry (1993-2005) were retrospectively analyzed. Primary admitted patients with an injury severity score ≥16, without isolated head injury were included. Patients were analyzed according to the injury pattern as liver injury (Abbreviated Injury Scale - AIS abdomen <3 and AIS liver 2-5; n=321), non-liver abdominal trauma (AIS abdomen 2-5 or AIS liver <3; n=574) and control group without abdominal injuries (AIS abdomen or liver <3; n=9,574). **Results.** Severe liver injury was associated with excessive demands for volume resuscitation and induced a significantly increased risk for sepsis and multi-organ failure (MOF) compared to both other groups (sepsis 19.9% vs. 11.0%; MOF 32.7% vs. 16.6%). Furthermore, deleterious outcome was more frequently associated with severe liver trauma (mortality 34.9%) compared to severe abdominal trauma (12.0%). **Conclusion.** Severe liver trauma is an independent predictor for severe haemorrhage with a substantially increased risk of sepsis and multi-organ failure (MOF) compared to both other groups (sepsis 19.9% vs. 11.0%; MOF 32.7% vs. 16.6%). Furthermore, deleterious outcome was more frequently associated with severe liver trauma (mortality 34.9%) compared to severe abdominal trauma (12.0%).

**Key words**


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**Introduction**

Isolated trauma of the liver is a rare event in blunt injuries of severely injured patients; yet liver injuries probably lead to a clear increase in post-trauma mortality due to the complex functioning of this organ. The immunological changes caused by blunt liver trauma are just as difficult to classify as the specific mortality. As the liver injury increases in severity, other organ systems become involved, so that total mortality results from the cumulation of all damaged organs. However, there are definitive indications leading to speculation that liver involvement superproportionally increases total mortality [1-4]. The mortality rate after liver trauma documented in the literature is widespread and ranges between 7 and 36% [5, 6]. This is differentiated between early mortality, mainly due to blood loss, and late mortality. Late mortality is frequently based on secondary complications from intensive medical treatment in connection with immunological failure after a trauma which can cause sepsis/SIRS and multi-organ failure. The actual specific significance of liver injury for the emergency of such complications in this event is to date not yet fully understood.

The liver is crucial to the post-traumatic recovery of a severely injured patient. This is where proteins are formed, which constitute among other things components for coagulation and non-specific defense. It has a decisive effect on inflammatory processes and represents the center of the energy metabolism. Moreover, the Kupffer cells represent the largest macrophage pool in humans. The knowledge that liver damage alone negatively affects both early and late mortality may be an initial approach leading to organ-specific post-traumatic treatment.

In this context, it must be kept clearly in mind that the last two decades have seen a clear paradigm change concerning surgical treatment for liver injuries [7]. With the introduction of computer tomography and the availability of clotting factors, conservative treatment of the liver injury has become the method of choice for hemodynamically stable patients after blunt liver trauma [8]. Different studies have shown that 71-89% of all patients with blunt liver trauma can be successfully conservatively treated. As a result, the