

Road traffic accidents in southern Europe

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The current generation has far greater opportunities for motorized travel than their fore-

fathers. But their advantages have been achieved at a large cost – the human and economic costs. Road safety is considered to be a high priority issue in all European countries, but is not equally distributed across Europe. The real costs of deaths, injuries and social and economic consequences far exceed the estimates for the following reasons: incomplete and inaccurate accident statistics, long-term impacts of traffic injury and socio-economic dimensions of traffic injury.

The most important cause of significant blunt chest trauma are road traffic accidents accounting for 70-80% of such injuries. Pedestrians struck by vehicles is another causative mechanism.

Pathophysiology of Chest Trauma

In order to deal with chest trauma one has to realize the major pathophysiologies encountered in blunt chest trauma which involve derangements in the flow of air, blood, or both in combination. Sepsis due to leakage of alimentary tract contents, as in esophageal perforations, also must be considered.

Blunt trauma commonly results in chest wall injuries (eg, rib fractures). The pain associated with these injuries can make breathing difficult, and this may compromise ventilation.

Direct lung injuries, such as pulmonary contusions, are frequently associated with major chest trauma and may impair ventilation by a similar mechanism.

Shunting and dead space ventilation produced by these injuries can also impair oxygenation. Space-occupying lesions, such as pneumothoraces, hemothoraces, and hemopneumothoraces, interfere with oxygenation and ventilation by compressing otherwise healthy lung parenchyma.

At the molecular level, animal experimentation supports a mediator-driven inflammatory process further leading to respiratory insult after chest trauma. Following blunt chest trauma, several blood-borne mediators are released, including interleukin-6, tumor necrosis factor, and prostanoids. These mediators are thought to induce secondary cardiopulmonary changes. Blunt trauma that causes significant cardiac injuries (eg, chamber rupture) or severe great vessel injuries (eg, thoracic aortic disruption) frequently results in death before adequate treatment can be instituted. This is due to immediate and devastating exsanguination or loss of cardiac pump function. This causes hypovolemic or car-

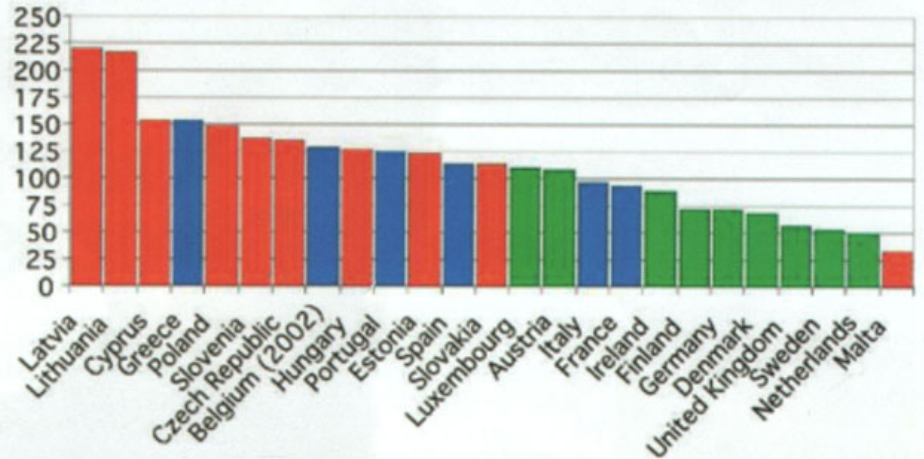


Fig. 1.: Road Accident Deaths per million Inhabitants for 2004, Road accident data in the enlarged European Union, European Transport Safety Council, Brussels 2006

Mechanisms and patterns of blunt thoracic trauma			
Mechanism of injury	Chest wall injury	Possible Thoracic-Visceral injuries	Common associated injuries
High velocity (deceleration)	Chest wall often intact sternum fracture bilateral rib fractures with anterior flail	Ruptured aorta; cardiac contusion; tracheo-bronchial disruption; ruptured diaphragm	Head and Max-Fax injuries; C-spine fracture; lacerated liver/spleen; long bone fractures
Low velocity (direct blow)	Lateral: unilateral rib fractures; anterior: fractured sternum	Pulmonary contusion; cardiac contusion	Lacerated liver/spleen if lower ribs involved Max-Fax injuries
Crush injury	Anteroposterior: bilateral rib Fractures; anterior flail; lateral: ipsilateral fractures; flail; possible contralateral fractures	Ruptured bronchus; cardiac contusion; pulmonary contusion	Fractured thoracic spine Lacerated liver/spleen; Lacerated liver/spleen

diogenic shock and death.

In traffic accidents it is also essential to understand the mechanisms of blunt thoracic trauma as very well Westaby pointed out in his book entitled "Cardiothoracic Trauma" in the following table, since it influences the patterns of injury.

Two cases are reported:

1. A complete left main bronchus rupture in a 23-year-old man after blunt chest trauma without any vascular injury (Figure 1).
2. An aortic rupture in a 46-year-old man after blunt chest trauma (Figure 2).

Figure 1

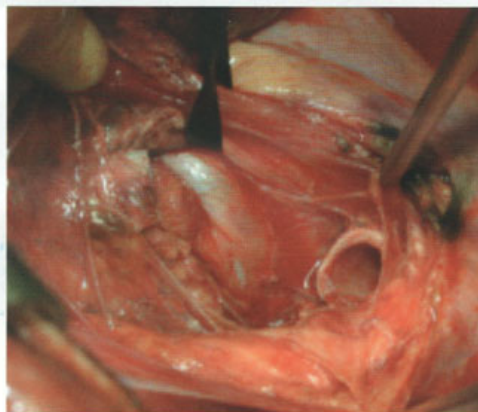


Figure 2

