Thoracic Trauma at Siriraj Hospital 1997-2006

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Thoracic trauma is a common injury that has a high mortality rate. Fortunately, most can be treated by a simple maneuver as intercostal drainage (79.4%). During the decade 1997-2006, there were 897 admitted patients in the Trauma division of Siriraj Hospital. Most were men (85.5%) and the common age group was 21-30 years. Blunt trauma was the major type of injury (58.9%) and traffic accidents were common causes. Abdominal injury was the most common associated injury. After the management was improved, the overall mortality rate was reduced from 7.0% to 5.1%. Today, minimally invasive surgery such as laparoscopy can reduce hospital stays and pain in patients with thoracoabdominal injury.

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Thoracic trauma is a significant cause of mortality. The clinical presentations, based on the research, show that patients frequently injured by both blunt and penetrating injuries, include a spectrum ranging from simple chest wall contusion to severe vital organ injuries[1,2].

Fortunately, most thoracic trauma can be treated effectively, and often definitively, by simple maneuvers such as intercostals drainage[1-4]. Thoracotomy is required 15-30% in penetrating trauma and less than 10% in blunt trauma. Even in penetrating trauma, urgent thoracotomy is required in only 15-30% of cases and less than 10% in blunt trauma[1,2,5].

In the past, there were 100-150 thoracic trauma patients admitted in the Trauma division of Siriraj Hospital annually[12]. Records of data collections were incomplete. The type of injury was predominantly blunt injury that seemed to be different from other countries especially the USA[1-4].

During this decade 1997-2006, the thoracic trauma management in Siriraj Hospital has changed from the past. The approach to diagnosis and treatment of thoracic trauma followed ATLS® and DSTC® guidelines.

The present study reviews the demographic data of thoracic trauma patients, cause of injuries, treatment and outcome during the decade (1997-2006) in Siriraj Hospital compared with the results of the past to improve the management and prevent the causes of injuries.

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Material and Method

The present retrospective study was done on the thoracic trauma patients who were admitted in the Trauma division of Siriraj Hospital between 1997 and 2006. The inclusion criteria was based on all admitted thoracic trauma patients who were treated in the Trauma Division of Siriraj Hospital between 1997-2006 and the exclusion criteria was based on the patients who were referred to another hospital before definitive treatment was performed.

Statistical analysis

The data of sex, age, type, cause, associated injuries, management, and outcome were collected and the statistical method was presented in frequency and percentage by SPSS® 15.0

Results

Between 1997 and 2006, there were 900 thoracic trauma patients in the Trauma division at Siriraj Hospital. Three patients were referred to other hospitals before definitive treatments were performed. Total patients who had definitive treatment were 897 including 767 (85.5%) men and 130 (14.5%) women (Table 1).

There were thoracic trauma patients in all age groups, but the most common age group was 21-30 years (31.7%). The oldest patient was 92 years old, and the youngest patient was 1 year old (Table 2).

Blunt trauma was the most common type followed by penetrating and gunshot wound (GSW). The most common cause of injury was traffic accident (407 cases, 45.4%) followed by body assaults (381 cases, 42.5%) (Table 3, 4). The most common associated injury was abdominal injury (157 cases, 17.5%) (Table 5).

Most thoracic trauma patients were treated with intercostal drainage (712 cases, 79.4%). Ninety-five cases (10.6%) were treated by thoracotomy and 161 cases (17.9%) were treated with exploratory laparotomy due to abdominal injury and injury to the diaphragm. Some patients were treated with minimally invasive surgery such as laparoscopy (23 cases, 2.6%) and video-assisted thoracoscopy (VATS) (3 cases, 0.2%). Some patients were treated as expectant manage-ment (87 cases, 9.7%).

The hospital stays were between one and 198 days and the median hospital stay was six days. The median hospital stay in the blunt injury group was seven days, penetrating injury group was five days, and gunshot wound (GSW) injury group was eight days. A comparison of the hospital stay to the treatments, the median hospital stay of intercostal drainage (ICD) group was six days, thoracotomy group was nine days, video-assisted thoracoscopy group was eight days, laparotomy group was four days, exploration group was nine days, and expectant group was two days.

When the patients were admitted, 767 (85.5%) cases were stable in clinical status, but 112 cases (12.5%) were unstable and 18 cases (2%) were post-cardiac arrested.

The mortality rate in the stable group was 0.4%, while the mortality rate in the unstable group was 24.1% and 88.9% in the arrested group. The overall mortality rate was 5.1% (6.8% in the blunt group, 2.9% in the penetrating group and 1.7% in the GSW group).

Table 1. Sex

	Frequency	Percent
Male	767	85.5
Female	130	14.5
Total	897	100.0

Table 2. Age groups

	Frequency	Percent
≤ 10	10	1.1
11-20	157	17.5
21-30	284	31.7
31-40	178	19.8
41-50	115	12.8
51-60	69	7.7
61-70	48	5.4
> 70	36	4.0
Total	897	100.0
Median age	23	

Table 3. Type of injury

	Frequency	Percent
Blunt	528	58.9
Stab	311	34.7
GSW	58	6.5
Total	897	100.0

Table 4. Cause of injury

	Frequency	Percent
Traffic	407	45.4
Falls	98	10.9
Assaults	381	42.5
Work	10	1.1
Other	1	0.1
Total	897	100.0

Discussion

Thoracic trauma is one of the most signi ficant causes of mortality[1,2]. All immediate life-threatening conditions are included in thoracic trauma and the potential life-threatening conditions that are high in morbidity and mortality are in thoracic trauma too.

Table 5. Associated injury

	Frequency	Percent
Neuro & spine	122	13.6
Facial	13	1.4
Abdomen	157	17.5
Pelvis	18	2.0
Extremities	125	13.9
Not associated	462	51.5
Total	897	100.0

There is no definite data in Thailand, but the estimated mortality rate in the USA is 10-25% of trauma death[1,5,6]. Mortality rates might be reduced if patients have prompt diagnosis and treatment. In the past, the mortality rate at Siriraj Hospital was 7.0% [12]. After the management had improved and followed ATLS® and DSTC® guidelines, patients who had immediate life-threatening conditions in thoracic trauma were quickly detected and received prompt treatments, so the mortality rate was reduced from 7.0% to 5.1%.

There are thoracic trauma patients in all age groups, but the high-risk age group is 21-30. Due to the risks of traffic accidents and body assaults, most thoracic patients are men (85.5%). Blunt trauma is more common than penetrating trauma, and traffic accident is the major cause.

Intra-abdominal organ injuries are the most common associated injuries due to thoracoabdominal trauma. Most of these patients are treated by non-operative management. The new investigation as FAST & CT can show the details and severity of injury especially the intra-abdominal solid organ injuries. That is why the rate of exploratory laparotomy was reduced from 24.9% to 17.9%.

Some penetrating thoracoabdominal injured patients had diaphragmatic injuries, which were detected and treated by minimally invasive surgery such as laparoscopy[8-10]. The outcome was quite good. Laparoscopy reduced the hospital stays and reduced the pain to these patients[8,9]. Besides that, the authors used video-assisted thoracoscopy (VATS) for some patients who had empyema thoracis and clotted hemothorax. VATS can reduce the rate of thoracotomy and the pain[11].

Conclusion

The Thoracic trauma cases at Siriraj Hospital were predominantly blunt trauma and mostly traffic caused. With early detection and prompt treatment using ATLS® and DSTC® guidelines, the mortality rate was reduced from 7.0% to 5.1%. Minimally invasive surgery such as laparoscopy and VATS reduced the hospital stays and the pain in the patients who had thoracoabdominal injury.

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การบาดเจ็บที่ทรวงอกที่โรงพยาบาลศิริราชในช่วงระหว่างปี พ.ศ. 2540-2549

เลิศพงศ์ สมจริต, กฤษณ์ แก้วโรจน์, พรพรหม เมืองแมน, เรวัต ชุณหสุวรรณกุล, ปรีชา ศิริทองถาวร, ชุมพร พงษ์นุ่มกุล

การบาดเจ็บที่ทรวงอกเป็นการบาดเจ็บที่พบได้บ่อย และมีความเสี่ยงต่อการเสียชีวิตสูง โชคดีที่การรักษาส่วนใหญ่ทำได้โดยการทำหัตถการง่าย ๆ เช่นการใส่ intercostals drainage (ร้อยละ 79.4) ในช่วงทศวรรษที่ผ่านมา (พ.ศ. 2540-2549) มีผู้ป่วยบาดเจ็บที่ทรวงอก 897 ราย เข้ารับการรักษาในสาขาศัลยศาสตร์อุบัติเหตุ โรงพยาบาลศิริราช ผู้ป่วยส่วนใหญ่เป็นเพศชาย (คิดเป็นร้อยละ 85.5) และกลุ่มอายุที่พบมากที่สุดคือ กลุ่มอายุ 21-30 ปี พบการบาดเจ็บชนิด blunt เป็นส่วนใหญ่ (ร้อยละ 58.9) และส่วนใหญ่แล้วเกิดจากอุบัติเหตุทางจราจร การบาดเจ็บในช่องท้องเป็นการบาดเจ็บร่วมที่พบได้บ่อยที่สุด ภายหลังการปรับปรุงแนวทางการรักษาแล้วอัตราการเสียชีวิตลดลงจากร้อยละ 7.0 เป็นร้อยละ 5.1 นอกจากนี้ยังพบว่าการรักษาแบบ minimally invasive surgery เช่น laparoscopy ช่วยลดความเจ็บปวดและระยะเวลาในการพักรักษาตัวในโรงพยาบาลในผู้ป่วย ที่มีการบาดเจ็บชนิด thoracoabdomen ได้