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Evaluation of Facial Trauma Severity in Cipto Mangunkusumo Hospital Using FISS Scoring System

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Background: Many scoring systems were introduced to search prognostic value in trauma patients. Facial trauma is a special trauma because it can cause many disabilities in facial function. There have been several reports on facial severity scoring system, such as Facial Injury Severity Score (FISS) and Maxillofacial Injury Severity Score (MFISS). Although these scoring systems have been introduced in many journals, they are not yet used by many clinicians because of their unawareness of its beneficiary. In this study, we want to introduce and apply these scoring systems in our maxillofacial data, thus it can be used for documentation system, as a research tool, and have prediction value for prognosis

Method: We retrospectively collected data on patients with facial trauma in Cipto Mangunkusumo Hospital in 2009. The data collected were age, gender, etiology, use of helmet, type of fracture and treatment given. Each patient then evaluated by FISS score to obtain their degree of severity

Results: Using FISS score introduced by Bagheri, we found the average FISS score ini this evaluation was 3,37 ± 1,9, with minimum value 1 and maximum value 9. Most patients have FISS score 2 (24,7%)

Conclusion: From FISS scoring system, we found that most of maxillofacial trauma in Cipto Mangunkusumo hospital in 2009 was mild trauma. In order to evaluate if FISS scoring system has predictive value for prognosis, a large sample and complete maxillofacial database are needed.

Keyword: facial trauma, injury score

Latar belakang : Sistem skoring telah diperkenalkan sebagai alat untuk mencari nilai prognosis pada pasien trauma. Trauma wajah memerlukan sistem skoring yang berbeda karena banyak gangguan fungsi yang bisa ditimbulkan. Beberapa jurnal telah melaporkan adanya sistem skoring untuk trauma maksilofasial seperti Facial Injury Severity Score (FISS) dan Maxillofacial Injury Severity Score (MFISS). Tetapi sistem skoring ini tidak banyak diketahui manfaatnya oleh para klinisi. Pada penelitian ini, kami ingin memperkenalkan dan menerapkan sistem skoring ini untuk mengevaluasi pasien trauma maksilofasial

Metode: Kami mengumpulkan data trauma wajah secara retrospektif yang terjadi di RSCM pada tahun 2009. Data yang dikumpulkan adalah umur, jenis kelamin, pemakaian helm, jenis fraktur dan terapi yang diberikan. Dilakukan penghitungan skor FISS untuk mendapatkan tingkat keparahan trauma

Hasil: Dengan menggunakan skor FISS, didapatkan skor rata-rata adalah 3,37 ± 1,9, dengan nilai terkecil 1 dan terbesar 9. Skor terbanyak adalah 2.

Kesimpulan: Dari sistem skor FISS didapatkan sebagian besar trauma maksilofasial di RSCM tahun 2009 adalah trauma ringan. Untuk mengetahui apakah sistem skoring FISS mempunyai nilai prediksi untuk prognosis, dibutuhkan penelitian lebih lanjut dengan jumlah sampel yang besar dan kelengkapan data pasien trauma maksilofasial.

Kata Kunci: facial trauma, injury score

Scoring system has emerged since 1970's to measure severity level in patients, especially trauma patients. These scoring system are aim to search for prognostic value for trauma patients, in order to become a measuring tool in research. At the beginning, most of scoring systems, only evaluate trauma in general, such as Injury Severity Score (ISS)[1-2], Trauma and Injury Severity Score (TRISS)[3-4], and New Injury Severity Score (NISS)[5]. These scoring systems were believed to have predictive value upon trauma patients[1-5]. Afterward, scoring system begin to emerged for special cases, such as Acute Physiology and Chronic Health Evaluation (APACHE)[6], Mathematical Model of Hemorrhagic Shock

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(MMHS)[7], Pediatric Trauma Score in children[8], and Hand Injury Severity Scoring System (HISS)[9].

Unfortunately, almost all of these scoring systems do not evaluate disabilities in each specific organ. These disabilities can cause morbidities, which are undefined and unmeasured inside these scoring systems.

Maxillofacial traumas rarely cause mortality, but they usually have complication in functional disabilities. In some literature, new scoring systems have been introduced to evaluate severity level of maxillofacial traumas which can be used as a tool in research, evaluating demographic data and be used to predict prognostic outcome. Some of them were able to combined previous injury score with functional parameter of the face, such as Maxillofacial Injury Severity Score (MFISS) and Mandible Injury Severity Score (MISS)[10-11]. Zhang has found in his study that MFISS has significant correlation between severity of trauma with cost and length of stay[10]. Other scoring systems were made simple yet proven to have predictive value, such as Facial Injury Severity Score (FISS) and Chinese Maxillofacial Trauma Registry, Analysis and Injury Severity Score System (CMISS)[12-13]. FISS score was introduced by Bagheri in Journal Oral Maxillofacial Surgery 2006. In this scoring system, each fracture site and laceration on the face will add points to obtain final score. Bagheri, with total of 247 patients in his study, also found FISS has correlation with total operation cost and length of stay. Trauma specification in FISS score are shown in Table 1.

Although these scoring systems have been introduced in many journals, they are not yet used by many clinicians because of their unawareness of its beneficiary. In this study, we want to evaluate and apply the use of scoring system in our maxillofacial data, thus it can be used for documentation system, as a research tool, and have prediction value for prognosis.

METHODS

This study is a retrospective descriptive study to evaluate the use of FISS maxillofacial trauma classification in patients. We collected data from medical records of all maxillofacial trauma patients from emergency room and outpatient clinic in Cipto Mangunkusumo hospital during January – December 2009. All maxillofacial trauma patients data was retrospectively collected using ICD-09. Data collected were identity data (name, gender, age) and specific data (etiology, use of helmet, type of fracture and treatment given). Each patient then evaluated using FISS score to obtain their severity level.

RESULTS

In this study, there were 75 cases of maxillofacial trauma in the period of January – December 2009. There were 2 data missing out of 75 cases. From 73 cases, the average age was 27,5 ± 11,5 years old, with the youngest age was 5 years old and the oldest was 56 years old. Ratio between male and female was 85,3 : 14,7.

From 73 patients, the most common biomechanism of trauma was motorcycle accident as much as 81,4 %. More than half of these motorcyclist were not using helmet as head protection (54,4%).

Treatment given to reconstruct facial fracture was being done using plate and screw, conservative treatment. Other patients, as much

Table 1. Facial Injury Severity Score

Trauma Specifications	Points
Mandible :	1 point
Dentoalveolar	2 points
Fracture on corpus/ramus/simfisis	1 point
Fracture on condyle/coronoid	
Mid-facial :	
Each facial fracture was give 1 point, except for complex fracture	
Dentoalveolar	1 point
Le Fort I	2 points
Le Fort II	4 points
Le Fort III	6 points
(unilateral Le Fort was given half the point)	
Naso-Orbital Ethmoid (NOE)	3 points
Zygomatico Maxillary Complex (ZMC)	1 point
Nasal	1 point
Upper third facial	
Roof/ wall of orbital	1 point
Fracture os/sinus frontal displaced	5 points
Fracture os/sinus frontal nondisplaced	1 point
Facial Laceration	
Over 10 cm	1 point

Table 2. Reconstruction treatment for maxillofacial

Treatment	Number of Patients	Percentage (%)
Refuse treatment	31	42,5
Conservative	14	19,2
Operation using plate screw	28	38,4
Total	73	100

as 31 patients, refuse treatment, which was 42,5 %. Mortality rate was 2,7% with the cause of death was herniation of cerebrum.

Using FISS score introduced by Bagheri, we found the average FISS score ini this evaluation was 3,37 ± 1,9, with minimum value 1 and maximum value 9. Most patients have FISS score 2 (24,7%).

Table 3. FISS score of maxillofacial trauma patients in 2009

FISS Score	Number of Patients	Percentage (%)
1	14	19,2
2	18	24,7
3	8	11
4	12	6,4
5	11	15,1
6	4	5,5
7	4	5,5
8	1	1,4
9	1	1,4
Total	73	100

DISCUSSIONS

We found the number of maxillofacial trauma cases in 2009 was 75 patients. Average age was in young adults and male patients were 8 times more than female patients.

Most common etiology was motorcycle accident and more than half of them do not wear helmet. This shows the lack of discipline to traffic rule in most of our motorcyclist.

Many of our patients refuse operation in 2009, which was 42,5%. Patients who do not have functional disabilities were treated conservatively without the need of operation. The entire patient going through surgery as treatment was using plate and screw for fixation of facial fracture. None of them were

using interfragmental wiring to fixate the fracture because the gold standard for facial fracture fixation is plate and screw. The availability of plate and screw was supported by the existence of Public Health Insurance by Government (Jamkesmas) which will cover the cost of plate and screw and the whole operation.

In this study, FISS score was used to evaluate the severity level of maxillofacial trauma because this scoring system is simple, data needed to calculate FISS score was available in the medical records. This scoring system has not added functional disabilities as one of its determinant variable. From the previous Bagheri study, they found that this scoring system has correlation with length of stay and operational cost. Thus this scoring system can be used to evaluate severity level of maxillofacial trauma patients.

In MFISS score introduced by Zhang, functional disabilities have been made as a determinant factor in the scoring system. MFISS is a classification system using three of the highest points according to Abbreviated Injury Score – 90 (AIS-90) and combined with three functional parameter of maxillofacial. This scoring system needs data on amount of teeth with malocclusion (MO), limited mouth opening (LMO), and deformity of the face (FD) [10] . Even though MFISS has included some functional parameter of the face, it has not yet include orbital function disturbance in its parameter. Unfortunately, these data were never specifically documented in our maxillofacial trauma database. Thus, even though MFISS has include functional parameter of face, we cannot evaluate MFISS score in this study.

Average FISS score was 3,37, with the most common score was 2, and only 1 patient with the score 9. From this score we can conclude that most of the trauma had minimal score. In previous study, Bagheri found the average FISS score was 4,4 and maximal score was 13[12]. The different range of scoring from our study to theirs is probably due to the high velocity trauma in Bagheri study, causing more severe facial trauma. While in Jakarta, most of maxillofacial traumas are due to low velocity

trauma. This low velocity trauma, it might be because of the high level of traffic jam in Jakarta, combined with the lack of discipline to traffic rules, can cause frequent yet mild maxillofacial trauma.

CONCLUSION

From FISS scoring system, we found that most of maxillofacial trauma in Cipto Mangunkusumo hospital in 2009 was mild trauma. This is probably due to the mechanism of trauma which was low velocity injury of motorcyclist. Thus, we have to complete maxillofacial trauma database with several new data such as number of teeth with malocclusion, minimal mouth opening and types of facial deformity occurred.

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