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CERVICAL SPINE INJURY;
CLINICAL OUTCOME OF PATIENTS TREATED WITH AND WITHOUT SURGICAL INTERVENTION.

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ABSTRACT… Objectives: To measure outcome of patients with cervical spine injury treated with and without surgical intervention. **Study Design:** Cross sectional study. **Place and Duration of Study:** 3years, Department of neurosurgery, Nishtar hospital Multan. **Patients and Methods:** Total 43 patients with cervical spine injury fulfilling the inclusion and exclusion criteria were admitted from OPD and emergency department of Nishtar Hospital Multan. Patients were examined for motor loss at the time of admission and on follow after the assigned treatment. MRI neck was performed in all patients. **Results:** There were 43 patients in total. Males were 31 (72%) while females were 13 (28%) with 2.5:1 ratio. Mean age was 33.92 ± 11.4. Mean Power grade was 2.2± 1.4 at the time of admission while on follow mean Grade of power was 3.34±1.51 with P value of 0.00. **Conclusion:** Cervical spine injury patients are associated with Improvement in power with or without surgical intervention.

Key words: Cervical spine, Injury, Surgical, nonsurgical

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INTRODUCTION

Cervical spine injury most of the time is associated with spinal cord injury which is defined as an acute, traumatic lesion of the neural elements in the spinal canal. This is one of the most devastating events with significant morbidity and mortality, resulting in varying degree of sensory deficit, motor loss, or bladder/bowel dysfunction which may range from inconsequential symptoms at one end of the spectrum to total neurological loss below the level of injury at the other.[1]

Injury to cervical spine is mostly due to blunt trauma. Incidence ranged between 2% to 6 % of all blunt trauma patients suffer cervical spine injury, out of which 10% to 25 % may deteriorate later on.[2] Reported incidence of cervical spine injury was up to .06% population with spinal cord injury in almost 55 % of the cases.[3,4]

Victim of this injury belong to younger age and mostly affect the male members. The effect of injury not only result in physical dependency of the individual to other family members on one part, but also whole family suffered physically, mentally and economically.[5]

Once a neurological deficit has occurred as a result of spinal injury it is often irreversible and patients who have been rendered paraplegic or quadriplegic remain so for the rest of their lives. The best treatment of this disability is that it should not occur in the first place. Hence prevention of spinal injury is the mainstay of the management which in turn will decrease the overall burden on hospital and community.

With a lot of work in recent times and recent advances in cervical spine instrumentation and surgical techniques, surgical treatment is now most commonly advised to patients with cervical spine fractures. While the consequences of Conservative treatment can lead to post traumatic instability and chronic pain, which can be a constant source of disability.[6] The main purpose of surgical treatment are to achieve maximum function, minimal pain, neurological improvement and future disability prevention. Surgery offers best restoration of anatomy, direct decompression of neural elements, early mobilization and less nursing

care problems.[7] The controversies are now mostly about the approach used: anterior, posterior or combined approaches.

In recent years anterior approach is gaining popularity. Most of the cervical spine fractures are treated with anterior approach. It is less traumatic and can directly decompress the cord, achieves better fusion rates and there is no need for adjacent segment fusion like in the posterior approach. The rate of infection in posterior approach is high, can lead to late deformity and it cannot address disrupted disk.[8] However, posterior approach is used in locked facets in cases of cervical fracture dislocations and severe instability where anterior procedure alone may not be sufficient.[9]

In Pakistan Spinal cord injuries (SCI) are initially managed by neurosurgeons, spinal surgeons and in some cases even by orthopedic surgeons' in general surgical wards. Majority of the patients are discharged with only an advice for physiotherapy and exercises. Dedicated spine surgery centers are not present in our set up along with rehabilitation units are conspicuously missing and spinal rehabilitation consultations are rarely made. Social support systems for paraplegics are missing and a patient of SCI very rarely goes back to main stream society.

This study was carried out to determine the clinical outcome in terms of improvement of power in patients with cervical spine injury. Only few studies are available and most of them either emphasize on surgical or conservative management separately, here we are presenting our data regarding surgical and nonsurgical management in a developing country with reference to etiological factors, gender, age group, level of injury and initial surgical consultation.

MTHODOLOGY

This study was carried out at the neurosurgery department of Nishtar Hosptial, Multan. All new patients fulfilling the inclusion and exclusion criteria, admitted with cervical spine injury between 2010 and 2013 were included. After ethical board review from hospital ethical committee. Patient data were kept on a designed Performa. MRI performed in all patients and the Study variable included patient's demography, mode of injury, level of injury, diagnosis, neurological status, and treatment surgical and nonsurgical. Mechanism of injury was classified as road traffic accidents (RTA), falls, hit by cow and fire arm injuries. To assess power of limbs status power score used from 0-5 at the time of admission and after discharge.

All available operated and non-operated patients were followed-up at 6 weeks, 3 months, 6 months and then yearly. The parameters noted at follow-up were the improvement in power, deterioration, hardware failure and death. Data were loaded in SPSS version 19 and analyzed for descriptive statistics and frequencies. Independent T test used to compare means and P value of $\leq$ 0.05 will be considered significant.

RESULTS

Forty three patients were included in the study. The mean age and power at the time of presentation was 33.9 and 2.26 shown in Table 1When patients divided according to age groups most of these patients were between 10-30 years as shown in table II. Most of the patients were male 31 while only 12 female Fig 1. Regarding mechanism of injury road traffic accidents were the commonest cause of injury followed history of fall and fight shown in Table 3. When the patients were grouped according to level of injury C5-C6 found to be the most common followed by C6-C7 shown in Fig 2, Table IV. Out 43 patients 29 patients underwent surgical intervention while 14 patients managed conservatively as in Table 5.When patients were followed up for a minimum period of 6 month the mean improvement in power grade was 3.3 as compared to 2.2 as in Table-I. When we compare the means of grades of power before and after treatment we found a significant difference with P value of 0.00 shown in Table I. There were 3 deaths in our study two were in conservative and one in operative group.

	Minimum	Maximum	Mean	Std Deviation
Age	16	62	33.98	11.49
Power Grade (At presentation)	0	5	2.26	1.44
Power Grade (Follow Up)	0	5	3.34	1.5

Table-I. Descriptive statistics

P value (0.00) Using T test (comparison of power before and after treatment)

Age Distribution	Frequency	Percentage
10-20	20	46
21-30	12	28
31-40	7	16
41-50	3	8
50-60	1	2
Total	43	100

Table-II. Distribution according to Age groups

Level of Injury	Frequency	Percentage
C5-C6	14	33
C6-C7	10	23
C3-C4	8	19
C1-C2	4	9
C2-C3	4	9
C4-C5	3	7
Total	43	100

Table-IV. Level of injury

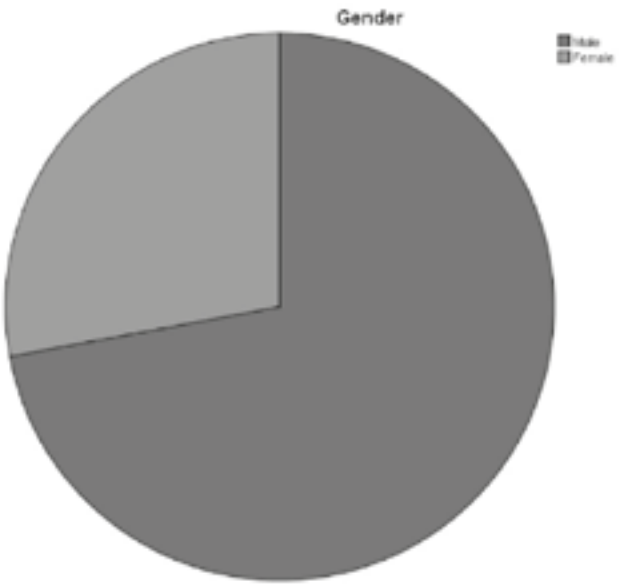

Fig-1. Gender distribution

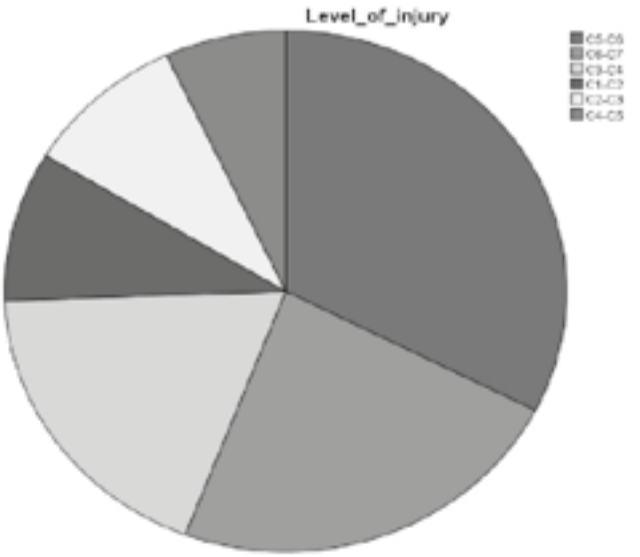

Fig-2. Distribution according to level of injury

	Frequency	Percentage
RTA	20	46.5
History of fall	12	27.9
History of fight	5	11.6
Hit by Cow	4	9.3
FAI	1	2.3
Suicidal	1	2.3
Total	43	100

Table-III. Mechanism of Injury

Treatment	Frequency	Percentages
Surgery	29	67.4
Conservative	14	32.6
Total	43	100

Table-V. Treatment plan

DISCUSSION

Cervical spine injury is mostly associated with Spinal cord injury, Presents in following patterns primary and secondary .The primary pattern results in permanent damage which is due to direct mechanical impact while secondary pattern results from vascular changes, electrolyte imbalance, neurotransmitter accumulation, excito-toxicity, production of free radicals, inflammation and apoptosis. Secondary injury is preventable as if immediate necessary actions taken at appropriate time. Early Vs delayed surgical intervention is still controversial .It is seen that if secondary injury is not addressed properly it may lead to persistent compression of the spinal cord.[10-14]

In our study forty three patients were included. Most of the patients belong to young age group with mean age of 33.9 the results were consistent with reported series in which the mean age was 32.7.[15] As in other parts of world such as Bangladesh, Jordan and Turkey males were predominantly involved as compared to female[16-18] which is similar to reported in our study, perhaps the male predominance is due to fact that male population is involved in outdoor work as compared to females. Male predominance is also in their most active and productive period of life are affected by spinal injury, which adds a serious economic loss to the community.

Regarding mechanism of injury in our study road traffic accidents were the commonest cause of injury followed history of fall and fight. Which is contrary to reported series from other countries like Bangladesh, India, Nigeria and Romania[19-21] while in accordance with Nikunj D et al[22] where 80% of the patients were having history of RTA.

Regarding level of injury C5-C6 found to be the most common followed by C6-C7 reported in our study while in other studies sub-axial cervical fractures reported C6-7 as the most commonly fractured vertebrae, while C5-6 and C6-7 were the most common levels of dislocation.[23] In our study significant improvement in power was noted which is supported by other series of Kleyn P[24], Starr et al[25] and Hadley et al.[26]

CONCLUSION

Patients presented with cervical spine injury were associated with good clinical outcome in terms of improvement of motor loss weather managed conservatively or surgically.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

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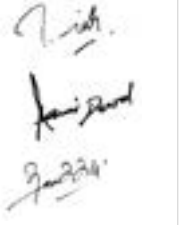
1	Muhamamd Sohaib Anwar	Study planning, designing, Supervision of research work. Proof reading of manuscript	
2	Dr. Amir Dawood Younis	Study planning, designing and paper writing	
3	Dr. Muhammad Ali	Data collection, Literature review and data entry	