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Research Article

Awareness of Healthcare Provider Toward American Spinal Injury Association Scale in a Tertiary Hospital: A Pilot Study

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Abstract

Background: The American Spinal Injury Association "ASIA" Impairment scale was published in 1992 and is widely employed to categorize motor and sensory impairments in spinal cord injury patients.

Objective: To determine the compliance and awareness of health care personnel to the ASIA scale.

Methods: This hospital-based cross sectional study was performed at King Abdualaziz Medical City. A survey composed of twenty questions was distributed to all health care providers working in the neuro-rehabilitation unit.

Results: No significant differences in gender distribution were observed in the study population. The majority had less than two years of clinical experience, and did not find application of ASIA scale compulsory. The main factor encouraging use of the scale was belief in its reliability, whilst inadequate training was thought to be the major hindrance. A lack of awareness amongst the study group was observed, however many found the scale satisfactory.

Conclusions: ASIA scale should be employed as a mandatory procedure in the management of spinal cord injury patients, as many studies have provided significant results favoring an improved prognosis of patients in comparison to previously used scales. Establishment of clinical courses and programs needs to be further researched from a cost-effectiveness point of view.

Keywords: *ASIA; Spinal; Injury; Awareness; Spinal Cord Injury*

Introduction

Spinal cord injury (SCI) is a rare but devastating condition causing loss of motor and sensory function together with bladder and bowel dysfunction [1,2]. The condition has a profound impact on a patient's quality of life affecting them not only physically but also psychosocially. Patients highest priority for restoration of functional activities to enhance quality of life are improvement of bladder and bowel function and walking ability [3]. Although research into SCI has progressed significantly, no promising therapy to reverse functional outcome is available to date. Most studies have been concerned with reports on functional outcome and rehabilitation, epidemiology, and interventional studies; which have been focused predominantly in developed countries where clinical trials are readily implemented.

Although the population of developing countries comprise more than 80% of the total global population [4,5], these countries lack research on SCI and data is sparse, particularly in Saudi Arabia where the incidence of SCI is amongst one of the highest worldwide [6]. Reports in the literature disclose that the two leading causes of SCI in the majority of countries are motor vehicle accidents and falls. Saudi Arabia and the Arab Republic of Egypt have been ranked first for the number of traffic accidents worldwide [7]. Therefore, further research within this region is paramount to contribute to improving the clinical care and management of SCI.

Over the last two decades, scientists have been focusing on strategies to improve the overall functional ability of patients living with SCI. In 1992, the ASIA "American Spinal Injury Association scale was published as an imperative tool to categorize motor and sensory impairment in spinal cord injury patients. The ASIA scale is a 5-point system designed to ultimately describe the severity of SCI and is also used as an index of recovery [8]. As ASIA scale assesses the functional status of SCI individuals, it has become widely adopted as an outcome measure of functional recovery or improvement of SCI patients after therapeutic interventions in clinical trials [9]. The ASIA scale is also commonly used in rehabilitation studies to determine improvement of scores post injury, after participation in various rehabilitation programs [10-12]. It objectively scores motor and sensory function, and the motor scores have predictive validity in explaining functional outcomes [13-16].

However, it has been argued in the literature that, although the ASIA impairment scale is important, it does not provide a complete analysis of patients' complications [13,14]. Regardless of this, it is still one of the most significant assessment means for SCI patients to date [17].

Due to the progression of the acute and chronic management of SCI, as well as improvement in both therapeutic and interventional measures, SCI patients have been given some hope for functional recovery and survival. Subsequently, knowledge of neurological impairment and recovery are imperative in determining the influence of these measures on the long-term recovery of SCI patients in order to plan and develop resources for both health and social care for these patients. As the ASIA scale is a validated measure of neurological deficits in SCI patients and studies exercising this scale in developing countries and within the Kingdom of Saudi Arabia are particularly lacking, the current study was designed to assess the awareness of ASIA scale amongst all health care providers dealing with SCI patients at a neurorehabilitation unit in a tertiary hospital.

Method

This cross-sectional study was conducted at the neurorehabilitation unit at King Abdualaziz Medical City, a tertiary care center in the Eastern region of Riyadh. Ethical approval for the study was obtained from the ethical committee of King Abdullah International Medical Research Center (KAIMRC).

Participants

All male and female health care providers involved in the care of spinal cord patients in the King Abdulaziz Medical City –Riyadh (KAMC-R) spinal rehabilitation unit were included in the study during the period 2 February 2015 to 2 June 2015. All professionals not directly involved in the care of SCI patients were excluded from the study. A total of 37 participants met the inclusion criteria and were include in the study and their characteristics are displayed in Table 1.

Survey Process

A questionnaire composed of twenty questions was prepared by the authors and reviewed by in internal expert. An external expert opinion was taken for verification and the questionnaire was validated, the questionnaire was then distributed to all health care providers working in the neuro-rehabilitation unit. Data was compiled and analyzed.

Data analysis

SPSS version 20 was used for data entry and analysis. Descriptive statistics, frequencies and percentages were used for categorical data. Chi-square test and Fisher's exact test were used to compare the level of satisfaction with the ASIA scale by the demographical data of the health care providers included in the study. A test with a p-value less than 0.05 was considered statistically significant.

ASIA Scale

American Spinal Injury Association "ASIA" Impairment scale (AIS) is used to categorize motor and sensory impairments in spinal cord injury patients. The AIS categories in the International Standards for Neurological Classification of SCI (ISNCSCI) Worksheet [23] are:

A = Complete. No sensory or motor function is preserved in the sacral segments S4-5.

B = Sensory Incomplete. Sensory but not motor function is preserved below the neurological level and includes the sacral segments S4-5 (light touch or pin prick at S4-5 or deep anal pressure) AND no motor function is preserved more than three levels below the motor level on either side of the body.

C = Motor Incomplete. Motor function is preserved at the most caudal sacral segments for voluntary anal contraction (VAC) OR the patient meets the criteria for sensory incomplete status (sensory function preserved at the most caudal sacral segments (S4-S5) by (light touch LT, pin prick PP or deep anal pressure DAP), and has some sparing of motor function more than three levels below the ipsilateral motor level on either side of the body.

D = Motor Incomplete. Motor incomplete status as defined above, with at least half (half or more) of key muscle functions below the single NEUROLOGICAL LEVEL OF INJURY (NLI) having a muscle grade ≥ 3.

E = Normal. If sensation and motor function as tested with the ISNCSCI are graded as normal in all segments, and the patient had prior deficits, then the AIS grade is E.

Results

A total of 37 health care providers were included in this study. There were no significant differences in gender distribution for the participants: male (51.4 %) and female (48.6%). More than a third of health care providers included in the study had less than two years of clinical experience (40%) (Table 1). Upon analysis of the frequency at which the ASIA scale was used by the health care providers, results revealed that approximately one third of the health care providers stated that "They ALWAYS use ASIA scale" (29.7%), approximately 50% dictated occasional use and (18.9%) admitted that "They NEVER use ASIA scale" Table 2. Surprisingly, just over half the study population (51.4%) did not feel it obligatory to implement ASIA scale assessment in the management of spinal cord injury patients.

		N	%
Gender	Male	19	51.4
	Female	18	48.6
Experience with health care	< 2 years	15	40.5
	2 years and < 5 years	4	10.8
	5 to 8 years	8	21.6
	More than 8 years	10	27.0
experience with SCI patient	< 1 years	19	51.4
	1 year and < 5 years	6	16.2
	5 to 8 years	6	16.2
	Not applicable	6	16.2

Table 1: *Demographical characteristics of the health care providers included in the study.*

Interestingly, the most encouraging factor, engaging the health care providers to adopt and utilize the ASIA scale was their "belief in its reliability" (70.3%). Whereas, the major obstacle hindering application of the ASIA scale by health care providers was inadequate training (51.3%). An ample number of health care providers were satisfied with the usage of ASIA scale, however they did state they felt a lack of awareness amongst the population. "There was NOT enough awareness about ASIA scale" (45.9%) (Table 2).

When comparing the satisfaction among health care worker toward the ASIA scale with gender, there is no significance difference between male and female (P = 0.74). Moreover, those who learned the ASIA scale in the university are mostly satisfied (73.9%), however the statistical difference was not significant (p = 0.10). Other comparisons are depicted in (Table 3).

Variable	Category	N	%
Usage of ASIA	Always	11	29.7
	Usually	9	24.3
	Occasionally	10	27.0
	Never	7	18.9
Obligation	yes	18	48.6
	No	19	51.4
factor encourage	Belief in its reliability	26	70.3
	as obligatory procedure	3	8.1
	Routine “optional “	5	13.5
	other	3	8.1
factor NOT encourage	No reliability	4	11.4
	inadequate training	18	51.4
	not obligated	7	20.0
	other	6	17.1
	No idea	3	8.1
Scale Adequately assess	yes	19	51.4
	no	2	5.4
	Don’t know	16	43.2
enough awareness	yes	10	27.0
	No	17	45.9
	Don’t know	10	27.0
First learn	university	23	62.2
	Self-learning	3	8.1
	Course	0	0.0
	At work	9	24.3
	Not Applicable	2	5.4
Regularly reassess	No	22	59.5
	Yes	15	40.5
Satisfaction with Scale	very poor	3	10.0%
	poor	5	16.7%
	good	12	40.0%
	very good	10	33.3%

Table 2: *Perception of Health Care Provider toward the ASIA scale.*

		Satisfaction with Scale				P-value
		Not satisfied		Satisfied		
		N	%	N	%	
Gender	Male	7	36.8	12	63.2	0.74
	Female	8	44.4	10	55.6	
Usage of ASIA	Always	3	27.3	8	72.7	0.06
	Usually	3	33.3	6	66.7	
	Occasionally	3	30.0	7	70.0	
	Never	6	85.7	1	14.3	
Obligation	Yes	8	44.4	10	55.6	0.74
	No	7	36.8	12	63.2	
Scale Adequately assess	Yes	4	21.1	15	78.9	0.43
	No	1	50.0	1	50.0	
Enough awareness	Yes	4	40.0	6	60.0	0.42
	No	4	23.5	13	76.5	
First learn	University	6	26.1	17	73.9	0.10
	Self-learning	1	33.3	2	66.7	
	At work	6	66.7	3	33.3	
Regularly reassess	No	11	50.0	11	50.0	0.19
	Yes	4	26.7	11	73.3	

Table 3: *Comparison of satisfaction of ASIA scale by participants' demographical characteristics.*

When asked about their first learning exposure to the ASIA scale, more than two thirds of the health care providers revealed that they first learnt about the scale at university (62.2%), whilst only a small proportion (8.1%) of them acquired knowledge about the scale via self-directed learning. It was unfortunate that the results also revealed that a vast majority of health care providers did not regularly reassess the patients with ASIA scale (59.5%). Finally, the most common category of ASIA impairment scale in the current study was found to be "Category B" (sensory incomplete) (45.9%) (Figure 1).

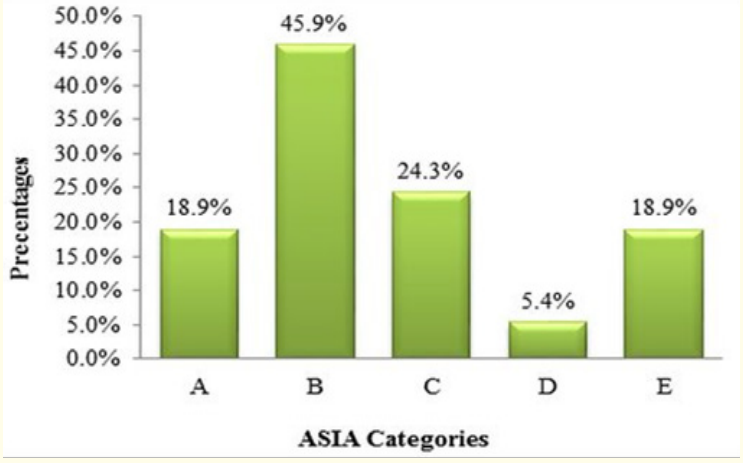

Figure 1: *ASIA scale categories encountered by health care providers.*

Discussion

Although the incidence and the prevalence of SCI in KSA has not been reported accurately in the literature, the Ministry of Health (MOH), Saudi Arabia and results from small, sample-sized, single hospital-based retrospective studies have indicated that Saudi Arabia is amongst one of the countries with highest rates of SCI in the world [18]. Despite this, research on SCI within the region is limited. There have been no studies to date investigating the application of ASIA scale in KSA.

As the ASIA scale is a standardized and recognized scale which is widely used internationally to assess impairment in SCI patients, we sought to determine the awareness and compliance of this scale in health care providers in KAMCR.

Our study revealed that a relative proportion of health care providers in KAMCR do use the ASIA scale, however, surprisingly; they do not feel it is an obligatory procedure in the management of spinal cord injury patients. The main factor encouraging these participants to use the ASIA scale was its reliability, which is comparable with other studies confirming the scale as reliable [16,19]. Results also exposed that lack of training of the ASIA scale was the main factor impeding application of the scale. This deprivation of training may be an explanation for why approximately 19% of the participants had never used the scale in their career history.

Training for ASIA scale is mandatory and typically is administered by a fully trained clinician in order to produce a reliable assessment of impairment within the patient. The lack of training observed in our study is a real cause for concern, highlighting the integral need for more studies to evaluate university education and provision of clinical training programs within the hospital setting, particularly in the rehabilitation units for spinal cord injury. This would prove beneficial to the both the treatment and outcome of these SCI patients in the long term.

Of the health care professionals who did administer the ASIA scale, most found it a satisfactory assessment of the impairment in SCI patients. Unfortunately, however, patients were not reassessed using the scale post injury or rehabilitation to determine outcome, which could potentially be conducive to poor outcome of these patients in the region. However, due to a scarce existence of information relating to the outcome SCI patients in KSA, genuine assumptions cannot be made about the outcome of these patients.

When assessing awareness of the health care professionals towards ASIA scale, almost half of the participants felt a lack of awareness within the community, suggesting this as one of the shortfalls in application of the scale in conjunction with the lack of training.

Approximately two-thirds of the participants stated that they acquired knowledge of the ASIA scale during their years at university; less than one-third during their profession and meager were self-taught.

The lack of awareness maybe attributed to insufficient clinical courses and clinical educational programs geared toward SCI. Further research on the establishment of clinical courses and programs and their contents is needed to determine if sufficient knowledge and training on neurological assessment of SCI patients is delivered to health care professionals; this may prove to be cost effective in the long-term management of SCI patients.

The last observation in our study was to determine the most common category of ASIA scale in SCI patients, which was ascertained as category B (sensory incomplete). This demonstrates that the severity of SCI in Saudi Arabia is steep and imposes a significant burden on health care services within the country.

Together, these factors suggest that focusing on implementation of both teaching and training of ASIA scale to medical students and clinical professional's involved in the care of SCI patients in Saudi Arabia may render favorable in the outcome of these patients.

Extensive research around the globe is being conducted on therapeutic interventions for potential treatment of SCI. Several of these studies use the ASIA scale to ascertain whether these therapies can safely improve functional outcome in SCI patients. Impairment is assessed using the scale both at the time of injury and post intervention to determine improvements, if any [9,20]. To complement this, studies have also used ASIA scale to predict needs of surgical interventions or procedures in SCI patients [17,21].

It is surprising that research on SCI in Saudi Arabia is less than optimal, since Saudi Arabia has been documented to have one of the highest occurrences of road traffic accidents worldwide and it has been documented that 79.2% of all patients admitted for spinal injuries in kingdom had sustained their injuries from road traffic accidents [22].

As there is substantial exposure to SCI patients in KSA, it is subsequently imperative to increase awareness and application of ASIA scale in the country, not only to accurately document the impairment in SCI patients, but also with the view to construct a productive management protocol for rehabilitation in these SCI patients to improve their functional outcome. As SCI imposes a significant burden on the health care system, this will additionally reduce the financial burden on the primary care facilities and families in developing countries.

Conflict of Interest

None.

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