Spinal Cord Injury Activation Alert: Revisiting and Revamping Protocols

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INTRODUCTION

Jefferson University is a spine center of excellence and a regional center for spinal cord injury. Global incidence of spinal cord injury is approximately 20 million cases worldwide with 12 thousand new cases a year. However, this leads to an annual total cost of 9 billion dollars to the US healthcare system.

Jefferson University has a "cord" system in place which allows any physician to enact a "Spinal Cord Injury Activation Alert". This sets forth a chain that leads to immediate consultation of Neurosurgery, Orthopedic surgery, Physical Medicine and Rehabilitation, Respiratory Therapists and often pushes patients to the top of the priority lists for imaging.

While this has been groundbreaking in creating an alert for the hospital that puts together a multi-disciplinary team that can best care for and identify sick patients, it has created a situation where the "cord" system is enacted without proper recognition of spinal cord injury or act risk patients leading to wasted resources, costly imaging, and unnecessary hospital expenses.

OBJECTIVE

Our objective was to look at the current protocol for spinal cord injury activation alerts and to highlight deficiencies in the system. Currently, any physician at Jefferson can call this alert, which often leads to a misuse of resources and wrongful identification of true spinal cord injury.

In order to refine the protocol, we believe that the Cord System should be used for the following guidelines:

1) Identify patients w Spinal Cord Injury (SCI)
2) Identify patients for SCI research trials
3) Identify patients who require surgery

DATA

Total Patients	
Total Cords Called 2017-2019	586
Neurologically Intact	340 (58%)
Motor Deficits	246 (42%)
Pilot Study	
Neurologically Intact	23/50 (44%)
Motor Deficits	27/50 (54%)
	ASIA A: 8 (30%)
	ASIA B: 3 (11%)
	ASIA C: 6 (22%)
	ASIA D: 10 (37%)
Fractures	42/50 (80%)
	Compression Fx: 8 (20%)
	Transverse Process Fx: 4 (10%)
	Distraction/ Dislocation: 18 (45%)
	Central Cord: 8 (20%)
MRI/Myelogram Performed	40/50 (80%)
Triple Spine Imaging	22/50 (44%)
Surgical Intervention	27/50 (54%)
Patient Enrolled in Research Trial	6/50 (12%)

RESULTS & METHODS

We conducted a prospective review of 586 charts that included all CORDS called between 2017 and 2019. Due to the overwhelming amount of data, we conducted a pilot study of 50 patients that were randomly chosen from the presented charts.

We reviewed these charts as well as the electronic medical record in order to highlight certain variables: whether or not those patients had a motor deficit, what ASIA score they received from PM&R, if the patient had a fracture during time of CORD, what type of fracture they had, whether or not the patient went to surgery, and whether or not the patient was enrolled in a research trial.

Our results found that out of 586 total alerts within a 2 year span, over 50% were neurologically intact which is highly unrepresentative of SCI. Furthermore, in our pilot study, it was found that only 54% of patients who were part of the cord alert ended up needing surgical intervention, and only 12@ were enrolled in an SCI research trial. We did find that a majority of cords got prompt imaging with almost 80% getting MRI or myelogram within 24 hours, and less surprisingly we found that almost 50% of all cases got triple spine imaging.

When delineating types of injury, 80% of all cords were associated with fracture, with 20% being superfluous (spinal cord stroke, MS flare, radiculopathy, etc.) Furthermore, there were many low velocity fractures that still enacted the SCI alert system, such as transverse process or compression fractures.

CONCLUSIONS

Our results show that the SCI is widely used but has significant room for improvement in order to delineate the patients who require it the most. We found that many patients who get this alert have no SCI which leads to unnecessary imaging, inappropriate consultation, and improper use of resources. Using this data, our next goal is to revamp and create a protocol for the SCI alert which will allow us to tailor the CORD alert to help those patients who need it the most.