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Drug Interactions in Iranian Veterans With Chronic Spinal Cord Injury - A Descriptive Study

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Abstract

Background: Veterans with chronic spinal cord injury usually have various comorbidities. They are, therefore, visited by different doctors and use different medications. It is necessary to monitor the health of these veterans. One of the important issues in this regard is the attention to drug interactions. The purpose of this study was to investigate the drugs used and their interactions.

Methods: This descriptive study of the cross-sectional studies was carried out retrospectively in 2015 under the Shefa Neuroscience Research Center's supervision, examining the medical records of veterans with spinal cord injury participating in the health screening program at Khatam Alanbiya hospital in Tehran. Demographic data, comorbidities, used drugs, and the level of involvement collected. According to the FDA, drug interactions among the drugs used for each patient has evaluated and classified into three severe, moderate, and weak groups. SPSS v. 21 analyzed data.

Results: The study population consisted of 404 men, ranging in age from 41 to 74, with a mean of 51.6±6.4 years. One hundred forty-two of them (35.1%) had a complete injury, and 262 veterans (64.8%) had an incomplete injury. Only 17 veterans (4.2%) had no drug interactions. The number of drug interactions varied from 1 to 38, with an average of 5.9±12.8 interactions per patient. The total number of interactions was 2856, of which 32.5% were weak, 55.3% moderate, and 12.2% severe, with a 95% confidence interval. Among the severe drug interactions in the study, the highest number belonged to the antidepressant drugs.

Conclusion: This study highlights the necessity of developing a strategy for investigating and preventing drug interactions in veterans with chronic spinal cord injury. It has recommended that physicians pay more attention to other medications used by the patient and prescribe as little as possible of the drug and the drug with the least number of interactions.

Keywords: Veteran; Spinal cord injury; Drug; Comorbidity.

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Introduction

Approximately 2000 people are living in Iran with spinal cord injuries related to the war. The average life expectancy of people with spinal cord injury is approximately 90% of normal individuals one year after the injury.[1,2] A spinal cord injury that lasts more than a year is called a chronic spinal cord injury, which can cause various physical and mental conditions in the long term. The Veterans Spinal Cord Injury Center has widely implemented the screening program for injured veterans in the health field. In this program, veterans are periodically visited at home and examined each year in specialized medical centers.[3,4] Patients with spinal cord injury take more medication because of chronic and comorbid problems. During these visits, it felt that the number of drugs used by these patients was much higher than the normal form. This was a sensitive issue and should investigate.

Whenever the use of a second drug alters the specific effect of a drug prescribed for a patient, drug interference occurs. A variety of drug interactions causes many of the side effects of the drug. It can found in various forms, such as drug interactions with drugs, drugs with foods, drugs with environmental factors, and drugs with diseases.[5,6] Many physicians and pharmacists do not spend the time needed to monitor all prescription and over-the-counter medications closely, and this inaccuracy in prescribing medications, especially for patients on a multi-drug regimen, can lead to drug interactions.[7,8] Patients with chronic refractory diseases require multiple medications because of the long course of the disease that usually leads

to the addition of other diseases to the primary problem. The advent of drug interactions in these patients can affect the extent and duration of the effect of the drug, meaning that none of the drugs has the full expected effects.[9,10] Drug interactions can also lead to a new disease, impaired drug tolerance, and deprivation syndrome, leading to physician misstatement in the diagnosis of the disease. It is more likely to be intolerant to drugs that have many drug interactions with other medications that mistakenly prescribed, and sometimes these interactions may lead to a new disease in the patient that may lead to more medications administered to the patient. In addition to damaging different organs, this issue increases the cost of the patient and their supportive treatment system.[11,12]

This study aimed to investigate possible drug interactions in veterans with chronic spinal cord injury referred to Tehran Khatam Alanbia hospital during the 2015 screening program.

Materials and Methods

This descriptive study of the cross-sectional studies was carried out retrospectively in 2015 under the Shefa Neuroscience Research Center's supervision, examining the medical records of veterans with spinal cord injury participating in the health screening program at Khatam Alanbiya hospital in Tehran. Integration criteria At least one year has passed since the spine injury, there is no date of hospitalization and mechanical ventilation three months before entering the center. Demographic data, comorbidities, used drugs, and the level of involvement collected. The types of injuries were determined based on the severity of the injuries caused by full or partial injuries and injuries to the neck, thoracic and lumbosacral, quadriplegia, and paraplegia. The number, type, and amount of all medications were collected by studying case files and questionnaires. According to the Food and Drug Administration (FDA), drug interactions among the drugs used for each patient has evaluated and classified into three severe, moderate, and weak groups. In severe interactions, simultaneous administration of two drugs is prohibited, in moderate interference, with caution, and in poor interference, the patient should inform of any potential complications.[13]

The data has recorded in each patient's file. Demographic data, medications, drug interactions, drug, and severity of drug interactions were analyzed by SPSS software version 21. Data were reported as percent, mean and standard deviation.

Results

The study population consisted of 404 men, ranging in age from 41 to 74, with a mean of 51.6 ± 6.4 years. The average post-SCI period was 29.09 ± 5.07 years. Thirty-four veterans (8.4%) had quadriplegia, and 370 (91.6%) were paraplegic. One hundred forty-two of them (35.1%) had a complete injury, and 262 veterans (64.8%) had incomplete injuries. Comorbidities have listed in Table 1. The number of drugs used was 3 to 28, with 5.3 ± 10.1 types of drugs per day.

In the study population, antidepressants used more than other drugs. Three hundred seventy-one people were taking antidepressants. Antacid drugs 88.6%, Anticonvulsants 79.2%, Antihyperlipidemic agents 68.3%, and Antihypertensive agents 65.6%, Vitamin and mineral combinations 65.1%, and other drugs were next (Table 2). Only 17 veterans (4.2%) had no drug interactions. The number of drug interactions varied from 1 to 38, with an average of 5.9 ± 12.8 interactions per patient. The total number of interactions was 2856, of which 32.5% were weak, 55.3% moderate, and 12.2% severe, with a 95% confidence interval.

Among the severe drug interactions in the study, the highest number belonged to the antidepressant drug group. Among the 349 severe interactions, there was at least one antidepressant drug in 230 cases, of which 126 were interactions between the two antidepressants, the most common antidepressant drug being the two SSRIs (selective serotonin reuptake inhibitor) and TCAs (tricyclic antidepressant) with 92 interferences.

The most common severe interactions were fluvoxamine and nortriptyline. Valproic acid and Clonazepam in the moderate group, Ranitidine, and Acetaminophen codeine, had the mildest group interactions.

Discussion

According to the results of this study, almost all veterans with spinal cord injury had drug interaction. This finding is important because these interactions can not only lead to prolonged illness and failure to respond appropriately to treatment, but may also cause the patient to discontinue one or more medications, or may need to add medications. Since patients' health is the top priority of the health care system; therefore, drug interactions and their complications should avoid for faster improvement. Drug interactions are also economically important in

Table 1. Comorbidities of Veterans With Chronic Spinal Cord Injury

Problem-Related to…	No.	%
Psychiatry	284	70.3
Cardiovascular	243	60.1
Pulmonary	277	68.6
Gastroenterology	281	69.6
Dermatology	232	57.4
Metabolic	126	31.2
Nephrology	260	64.4
Neurology	68	16.8
Musculoskeletal	264	65.3
Ophthalmology	105	26.0

Table 2. Type of Drugs Used by Veterans With Chronic Spinal Cord Injury

Drug Category	No.	%
Antidepressants	371	91.8
Antacids	358	88.6
Anticonvulsants	320	79.2
Antihyperlipidemic agents	276	68.3
Antihypertensive agents	265	65.6
Vitamin and mineral combinations	263	65.1
Miscellaneous GI agents	250	61.9
Cardiovascular agents	220	54.5
Antiplatelet agents	210	52.0
Uterotonic agents	199	49.3
Laxatives	190	47.0
Antiasthmatic combinations	187	46.3
Anxiolytics, sedatives, and hypnotics	178	44.1
Muscle relaxants	167	41.3
Antidiabetic agents	142	35.1
Analgesics	111	27.5
Anticoagulants	95	23.5
Dermatological agents	81	20.0
Antigout agents	74	18.3
Antipsychotics	59	14.6
Herbal products	40	9.9
Ophthalmic agents	34	8.4
Glucocorticoids	32	7.9
Antiarrhythmic agents	25	6.2
Antibiotics	23	5.7
Bone resorption inhibitors	23	5.7
Antiemetic agents	10	2.5
CNS stimulants	7	1.7

addition to the risks to patients' health and may increase the frequency of patient referrals and unnecessary paraclinical testing and thus increase medical costs.

The high cost of using overlapping drugs comprises a high percentage of the healthcare support budget of these patients, which may lead to a reduction in the number of services needed in this group.[14,15]

The results confirm the findings of a study conducted on 150 wounded in Tehran, showing that 148 patients had interfered with their medication.[16] According to the results of this study, the more drugs the patient uses, the greater the chance of drug interference. Other studies confirm this result, for example, in one study showing a linear relationship between the number of drugs and drug interactions. Another study also found that 15 percent of people taking multiple medications had significant and dangerous drug interactions[17-19] Some patients take other medicines arbitrarily, regardless of the drug interference problem, with the current prescription medication, and here the issue of the physician's attention to other medicines used by the patient becomes apparent.[12]

Our study showed that about 12% of all drug interactions in patients are of severe interactions. In this regard, other studies' results were varied and more or less than the results obtained in this study. Some studies of patients with chronic diseases have reported very few drug interactions.[20-23] A study of antidepressant drug interactions with antihypertensive and hypoglycemic drugs found that of the 663 patients under study, only 29 patients had drug interactions.[24] While some other studies show that patients with chronic diseases are more susceptible to multiple drug interactions, for example, a study of US war casualties found that the effect of specific drug components has led to specific biological changes in about 90% of people receiving the drug. In that study, the highest number of drug interactions related to antidepressants[25] is similar to the present study results. Our study also showed that among antidepressants, most interactions were between tricyclic antidepressants and selective serotonin reuptake inhibitors. In other studies, antidepressants identify as the most common drugs with interactions. In one study of more than 1000 US war casualties, 62% of patients under the age of 60 and 96% of patients over the age of 60 were taking specific antidepressant medications, the majority of those who observed drug interactions consumed 5 to 6 drugs, including antidepressants.[25-27] Another study in Australia found that 15% of combat casualties use at least one antidepressant, and only 8% of them have drug interactions.[28] While our study showed that 91% of patients took antidepressants, and most of them had drug interactions.

Many of the drugs used to treat veterans with chronic illnesses are specific components of the drug, given their diseases that are not commonly seen in other social groups. Some of the specific drug components in these patients can lead to specific biological changes that judge the extent of the interference more complicated. In the case of antidepressants with the most interactions, it may seem that the problem may solve by prescribing single-family drugs rather than multiple families. While single-family drugs classified according to one of the pharmacological aspects of the drug, other directions may differ.[26-29]

Conclusion

The results of this study highlight the necessity of developing a strategy for investigating and preventing drug interactions in war injuries. Also, to reduce the side effects of drug interactions at the time of administration of the new drug, it is necessary to consider the biological differences in these patients due to taking several drugs.

The list of drug interactions is pervasive, with some added over time. Therefore, it is advisable to use the available scientific resources in groups at higher risk for

adverse drug reactions to ensure drug interference.

It recommended that physicians pay more attention to other medications used by the patient and consider their drug interactions. Also, prescribe as little as possible of the drug and the drug with the least number of interactions.

Conflict of Interest

The authors declare that they have no conflict of interests.

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Ethical Statement

In this study, an informed consent form was obtained from all participants to participate in the study. Also, patient information was not used for any purpose other than conducting the study, and patient information remained confidential.

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