

Alcohol Withdrawal Syndrome in Orthopaedic Practise – How to Avoid Disasters ?

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Abstrac: Alcohol withdrawal syndrome confers a high risk of morbidity in orthopaedic practise. Hence early detection and screening of alcohol withdrawal syndrome in admitted orthopaedic patients prevents the associated complications and decreases the length of hospital stay and is cost effective as well as. The aim of this study is to evaluate the role of a screening protocol model - employing biochemical markers – MCV and γ GT in conjunction with screening procedures of alcohol withdrawal syndrome (CAGE). Patients admitted in orthopaedic ward at our institution for surgical intervention from 2011-2015 are included in the study. All the patients with history of chronic alcohol intake of >60 mg/day¹⁰ (n=200) or patients admitted to emergency after trauma under alcohol influence(n=96) were included in the study (n=296). Patients were subjected to a Protocol model of screening of Alcohol withdrawal syndrome, where in they were evaluated with CAGE questionnaire and biochemical markers of MCV and γ GT and results were analysed. Effective screening which is rapid and cost effective would help in identifying alcohol abuse patients and there by AWS onset. CAGE questionnaire along with biochemical markers (MCV, GGT) together is an effective screening tool to prevent complications worsening fracture treatment.

I. Introduction

Alcohol withdrawal syndrome confers a high risk of morbidity in orthopaedic practise^{1,2}. Hence early detection and screening of alcohol withdrawal syndrome in admitted orthopaedic patients prevents the associated complications and decreases the length of hospital stay and is cost effective as well as³. Although screening of alcohol withdrawal syndrome in trauma patients has been investigated, complications of alcohol withdrawal syndrome and the importance of biochemical markers in relation to screening procedures have been less discussed.

The most feared postoperative complication of AWS is the development of an unforeseen delirium tremens. This can develop in chronic alcoholics who are alcohol-dependent according to the Diagnostic and Statistical Manual of Mental Disorders⁴ or the International Classification of Diseases⁵ criteria

The development of AWS can change a normal postoperative course into a life-threatening situation due to systemic infections, cardiopulmonary insufficiency, and bleeding disorders^{6,7,8}. Pre-operative complications after the onset of alcohol withdrawal include soft tissue and neurovascular injury around the fracture, worsening the fracture morphology (comminution and extension of fracture), thereby complicating the treatment and worsening the final outcome. The post-operative complications could range anywhere from infection to Implant failure or perimplant fracture.

Mean corpuscular volume (MCV) and gamma-glutamyl-transferase (γ GT) are the most commonly used biochemical markers that are sensitive in the assessment of patients with high-risk drinking behaviours⁹. MCV and γ GT can be employed routinely in all patients with history of alcohol dependence. The aim of this study is to evaluate the role of a screening protocol model - employing biochemical markers – MCV and γ GT in conjunction with screening procedures of alcohol withdrawal syndrome (CAGE). Secondly we would like to discuss the complications encountered in orthopaedic practise.

II. Methodology

Patients admitted in orthopaedic ward at our institution for surgical intervention from 2011-2015 are included in the study. All the patients with history of chronic alcohol intake of >60 mg/day¹⁰ (n=200) or patients admitted to emergency after trauma under alcohol influence(n=96) were included in the study (n=296). Patients were subjected to a Protocol model of screening of Alcohol withdrawal syndrome, where in they were evaluated with CAGE questionnaire and biochemical markers of MCV and γ GT and results were analysed. Patients with history of chronic alcoholism but who presented with head injury, metabolic disorders and previously diagnosed psychiatric illness were excluded from the study.

CAGE questionnaire¹¹ is a short, precise, and feasible 4-item questionnaire to screen chronic alcoholism (Table 1). Patients with a CAGE score >2 are considered chronic alcoholics. Buchsbaum et al.¹² found a good correlation between the CAGE results and the Diagnostic and Statistical Manual of Mental Disorders criteria for alcohol dependence.

1.	Have you ever felt you needed to Cut down on your drinking?
2.	Have people Annoyed you by criticizing your drinking?
3.	Have you ever felt Guilty about drinking?
4.	Have you ever felt you needed a drink first thing in the morning (Eye-opener) to steady your nerves or to get rid of a hangover? ⁴

Table 1 : Cage Questionnaire : Screening Of Chronic Alcoholism.

MCV and γ GT were checked on the next day of admission for every patient with history of chronic alcoholism and those admitted under influence of alcohol. No prophylactic was given to positively screened cases of this protocol. But, positively screened patients were planned to be operated with load bearing implants or locking plates for rigid fixation. Patients were followed up during hospital stay for symptoms of alcohol withdrawal syndrome and the complications encountered were analysed.

III. Results

The total number of patients who underwent orthopaedic surgeries during the study period of 2010-2015 in our institution was 2607. 296 patients among them fulfilled the inclusion criteria for alcohol abuse and were enrolled in the study. 48 patients lost to follow up and hence were excluded. Of the 248 patients, 229 (92.3%) were men and the rest 19 (7.7%) were women. Average age of the study group was 40.3 years (Range : 27-69 years). 62 patients had alcohol withdrawal syndrome, among whom 58 (93.5%) were males and 4 (6.5%) were females.

The socio-demographic profile of the patients who developed alcohol withdrawal syndrome is listed in table no 2.

	No of patients	Percentage
Marrital Status		
Never Married	14	23
Married	22	36
Divorced	18	29
Widowed	8	13
Educational Status		
Never been to school	24	38.7
Primary school	21	33.8
Middle School	11	17.7
Secondary School	5	8
Bachelors Degree or higher	1	1.6
Social History		
Difficulty with family members and relations	48	
Late to work	42	
absenteeism from work regularly	22	
Job loss	20	
Disability due to accident	12	

Table 2 : Socio-Demographic Profile Of Patients Who Developed Aws

Onset of clinical symptoms in AWS		
DURATION	Nof of patients	Percentage
0-24hours	10	16
24-48 hours	14	23
48-72 hours	24	38
>72 hours	14	23

Table 3 : Time Duration Of Onset Of Clinical Symptoms In Patients Who Developed Aws

Clinical Features	Nof of patients	Percentage
Restlessness	62	100
Insomnia	62	100
Tremors	62	100
Tachycardia	62	100
Profuse sweating	38	61
Disorientation in time and place	38	61
Moderate or severe dehydration	32	52
Markedly elevated systolic blood pressure	28	45
Visual hallucination	26	42
Temp >37.5 degrees centigrade	24	39
Amnesia	30	48
Convulsions	15	25

Table 4 : Clinical Profile Of Patients Who Developed Aws In The Study.

COMPLICATIONS		
Systemic Complications	Number	Percentage
Sepsis	1	1.60%
Cardio pulmonary Insufficiency	2	3.20%
Pre-operative complications		
Soft tissue injury around the fracture	26	41.90%
Neurovascular injury of the injured extremity	4	6.40%
Worsening the fracture morphology	21	33.80%
Post-operative complications		
Infection	15	24.10%
Implant failure	14	22.50%
Peri-implant fracture	6	9.60%

Table 5 : Complications Developed In Patients With AWS In The Study Group.

ALCOHOL WITHDRAWAL PATIENTS (N=62)	Number	Percentage
CAGE >2	57	92%
MCV & γ GT POSITIVE	47	76%

Table 6 : Comparison of CAGE and Biochemical markers in AWS Patients

The AWS patients were treated with sedation consisting of parenteral diazepam between 40mg to 60mg for 24 hours, then oral diazepam of 5-10mg 8 hourly for about 5 days. Intravenous 5% dextrose saline was used for treating dehydration. Nutritional supplements of vitamin B12 and folic acid were given for two weeks. Counselling of the patients at the time of discharge and every follow up was done. Two cases (both aged more than 60 years) who developed alcohol withdrawal expired during the hospital stay due to metabolic encephalopathy and underlying chronic liver disease worsening the morbidity.

IV. Discussion

This present study shows a prevalence of alcohol abuse at 9.5% and AWS as 2.3% of patients admitted at our centre during the study period. The onset of symptoms in our patients was 16% by 24 hours of admission, 38% by 48 hours, and 23% by 72 hours. Although symptoms of alcohol withdrawal were self-limiting and abate within 2-7 days of the last drink, 25% of our patients went on to develop withdrawal seizures (table 4).

The mortality rate for patients who progress to severe alcohol withdrawal syndromes and delirium tremens has been reported to approximate 20%¹³. However there was no mortality recorded in this study, despite many patients having severe symptoms. This may be due to early diagnosis, and prompt management.

Our study has documented the complications of patients who developed AWS. Although systemic complications are more severe, they are less frequent owing to early intervention in diagnosed patients and hospitalised patients. Local complications such as worsening of fracture morphology and soft tissue injury around the fracture are more common forms of complications in the hospitalised patients as well because these patients are highly non compliant and irritable and bear weight on the injured extremities after the onset of AWS. Implant failure and peri-implant fractures in non-hospitalised patients developing AWS in the post-operative period are also more common as they are non-compliant.

CAGE questionnaire is a faster assessing tool that can incorporated in to regular clinical practise to screen alcohol abuse and there by prevent AWS. Biochemical markers such as MCV and γ GT are economical and may add positive in screening alcohol abuse in conjunction with CAGE questionnaire, as in our study.

It should be emphasized, however, that all biological laboratory markers, whether commercially available or still at the research stage, can detect chronic alcohol use but cannot determine whether the patient is physically dependent¹⁴⁻¹⁸. Only the former require prophylactic treatment for the potential development of AWS. Nevertheless, chronic alcohol misusers are still at risk of developing other complications, such as infections, cardiovascular complications, and bleeding disorders^{14,15,18}

Biochemical markers with sufficient sensitivity and specificity may assist in the diagnosis and possible prevention of complications (Table 5). Mean corpuscular volume (MCV) and gamma-glutamyl-transferase (GGT) are often used, but neither is sufficiently sensitive (MCV 34%-89%, GGT 34%-85%) or specific (MCV 26%-91%, GGT 11%-85%)¹⁴⁻¹⁶. A recent biological laboratory marker, carbohydrate-deficient transferrin (CDT), may have specificity (82%-100%) and a sensitivity (39%-94%) greater than or equal to those of MCV and GGT^{19,20}. CDT are isoforms of transferrin²⁰. A chronic daily intake of >50-80 g of alcohol for longer than a week was reported to increase CDT levels.

V. Conclusion

AWS in an orthopaedic patient is more complicated to treat. Early diagnosis and intervention lessens the chances of complications in a hospitalised patient with extremity injury. Effective screening which is rapid and cost effective would help in identifying alcohol abuse patients and there by AWS onset. CAGE questionnaire along with biochemical markers (MCV, GGT) together is an effective screening tool to prevent complications worsening fracture treatment.

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