

# Prevention of alcohol withdrawal by the use of the prediction of alcohol withdrawal severity scale in hospitalized patients

## Abstract

Prevention of alcohol withdrawal by the use of the Prediction of Alcohol Withdrawal Severity Scale in hospitalized patients.

**Background:** Alcohol withdrawal (AW) is a serious complication of alcohol use disorder. We aimed to identify hospitalized patients at risk for AW using the Prediction of Alcohol Withdrawal Severity Scale (PAWSS) Score and to treat them preventively.

**Objective of the study:** Investigation of the value of the PAWSS for risk recognition and preventive treatment of AW in hospitalized patients.

**Methods and materials:** A retrospective medical records review of hospitalized patients with a history of alcohol use admitted from December 1<sup>st</sup> of 2019 and April 30<sup>th</sup> of 2020, in whom the PAWSS had been completed. Exclusion criterion was AW on admission. A PAWSS score of 4 predicts AW. Demographics, comorbidities, pertinent laboratory results, PAWSS score, use of benzodiazepine, and hospital course were recorded. The exclusion criterion was alcohol withdrawal on admission. De-identified data were stored in a password protected drive only accessible to the members of the study team and deleted from the drive at the completion of data collection and analysis. The study was approved by the Institutional Review Board. Sample of the study included twenty-nine subjects. Chi-square statistics were used to calculate unadjusted associations between predictors and the symptom status outcome.

**Results:** Twenty-nine patients were identified. Of these, twenty had a PAWSS <4, and nine scored ≥4. Eight of the nine patients who scored ≥4 and were treated with a benzodiazepine three-day tapering dose institutional protocol did not develop AW; the patient who was not treated preventively developed withdrawal symptoms (Table 1).

**Conclusion:** Preventive treatment based on a PAWSS score within the realm that predicts AW prevents the development of this complication of AUD.

**Recommendations:** We propose the system-wide use of the PAWSS in all hospitalized patients with AUD.

Volume 12 Issue 5 - 2021

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**Received:** August 15, 2021 | **Published:** September 17, 2021

## Background

Alcohol use disorder (AUD) has been estimated to affect approximately 5.8% of the general population in the United States (U.S.).<sup>1</sup> Approximately half of the patients with AUD experience alcohol withdrawal (AW), caused by dysregulation of the inhibitory neurotransmitter  $\gamma$ -aminobutyric acid and the excitatory neurotransmitter glutamate, resulting in autonomic hyperactivity.<sup>2</sup> AW consists of a range of symptoms and signs that typically develop in alcohol-dependent people 6-24 hours of their last drink. It may occur unintentionally if abstinence is enforced by illness or injury.<sup>3</sup> Three to five percent of hospitalized patients with AW progress to delirium tremens, a potentially life-threatening condition.<sup>4</sup> Severe withdrawal can require intensive care unit admission, and is associated with prolonged hospitalization, and increased in-hospital morbidity and mortality. Accordingly, the identification of patients at risk for AW offers the opportunity to prevent it.

The Prediction of Alcohol Withdrawal Severity Scale (PAWSS) Score was developed to aid in the recognition of hospitalized patients at risk for AW, allowing for the initiation of treatment to prevent this

complication.<sup>3</sup> The score is derived from a 10-point questionnaire, each question carrying an equal weight, with a score of at least 4 predicting alcohol withdrawal with a 100% sensitivity and specificity for the prediction of moderate or severe AW development.<sup>5</sup>

We implemented a quality improvement project to study the value of the PAWSS to identify patients admitted to the medical service with AUD at risk of AW. The use of the score was left at the discretion of the team responsible for the care of patients hospitalized in the medical service.

## Objective of the study

Investigation of the value of the PAWSS for risk recognition and preventive treatment of AW in hospitalized patients.

## Methods and materials

A retrospective medical records review of hospitalized patients with a history of alcohol use admitted from December 1<sup>st</sup> of 2019 and April 30<sup>th</sup> of 2020, in whom the PAWSS had been completed. Exclusion criterion was AW on admission. A PAWSS score of 4

predicts AW. Demographics, comorbidities, pertinent laboratory results, PAWSS score, use of benzodiazepine, and hospital course were recorded. The exclusion criterion was alcohol withdrawal on admission. De-identified data were stored in a password protected drive only accessible to the members of the study team and deleted from the drive at the completion of data collection and analysis. The study was approved by the Institutional Review Board. Sample of the study included twenty- nine subjects. Chi-square statistics were used to calculate unadjusted associations between predictors and the symptom status outcome.

## Results

Twenty-nine patients were identified. Twenty patients scored <4. Nine patients had a PAWSS score  $\geq 4$ , with a mean of  $5.56 \pm 1.24$ . Six of them were male. The average age was  $47.44 \pm 16.02$  years. Eight of the nine patients who had a PAWSS  $\geq 4$  on admission were treated with oxazepam, a benzodiazepine, according to the institutional protocol. One patient who scored at least 4 was not treated for alcohol withdrawal and subsequently developed withdrawal symptoms (Table 1).

**Table 1** Characteristics of the study group

Univariate statistics are presented as mean $\pm$ SD, median (Q <sub>1</sub> – Q <sub>3</sub> ), or n (%)	
Total number of identified patients in whom the PAWSS had been completed during their hospitalization.	29
Total number of identified eligible for PAWSS	Total = 9
Age, in years	47.44 $\pm$ 16.02
<b>Sex</b>	
Male	6(66.67)
Female	3(33.33)
Prediction of Alcohol Withdrawal Severity Scale(PAWSS) Score	5.56 $\pm$ 1.24
Treated with Benzodiazepine Taper Protocol	8(88.89)
Blood Alcohol Level, in mg/dL	157.44 $\pm$ 125.82
Platelet Count, in U*10 <sup>3</sup> /mCL	266.00 $\pm$ 78.50
Aspartate Aminotransferase(AST), in U/L	102.67 $\pm$ 63.19
Alanine Aminotransferase(ALT), in U/L	73.44 $\pm$ 53.71
Alkaline Phosphatase(ALP), in U/L	105.33 $\pm$ 49.62
Total Bilirubin, in mg/dL	0.60(0.40 –2.30)
Direct Bilirubin, in mg/dL	0.20(0.10 –0.40)
Sodium, in mEq/L	139.00(138.00–140.00)
INR	0.95(0.90 –1.10)
Albumin, in mg/dL	4.42 $\pm$ 0.92
Gamma-Glutamyl Transferase(GGT), in U/L	212.50(183.00–416.00)
Model for End Stage Liver Disease	12.11 $\pm$ 7.57
Withdrew During Admission	1(11.11)
Alcohol Liver Disease	2(28.57)
History of Pancreatitis	3(37.50)
History of Alcohol Withdrawal	8(88.89)
Hepatitis B	0(0.00)
Hepatitis C	2(25.00)
Hypertension	5(55.56)
Chronic Heart Failure	1(11.11)

## Conclusion

The preventive treatment of patients with AUD who have a PAWSS score within the realm that predicts AW prevents this dangerous complication of AUD. The majority of the patients who had a PAWSS

score within the realm that predicts AW and received preemptive treatment did not develop AW.

The diagnosis and treatment of florid AW is established; however, recognition and identification of individuals at risk for AW, and

its prevention, fundamental in the care of patients with alcohol use disorder, appears to be an unmet clinical need. The results of this quality improvement project support the use of the PAWSS in hospitalized patients to identify those at risk for AW and treat them preventively.

## Recommendations

We propose that the PAWSS be incorporated in clinical practice and in all electronic medical record systems.

## Acknowledgments

We thank Dr. Bergasa and Dr. Mercado for their guidance during the course of research and for their comments that greatly improved the manuscript.

## Conflicts of interest

The authors declare no conflicts of interest related to this article.

## Funding

None.

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