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Original Research

Prevalence of alcoholic hepatitis and corticosteroid resistance in urban south indians: a cross-sectional study

Navakanth Raju Ramayanam, Rajeshan Nanda Amarnath, Vijayakumar Thangavel Mahalingam

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Abstract

Objective: Alcoholic hepatitis (AH) is a severe liver disease caused by excessive alcohol consumption. Urban South Indians face unique socio-demographic characteristics and lifestyle choices that may increase their susceptibility to AH. Understanding the prevalence of AH and factors contributing to corticosteroid resistance in this population is essential for effective management and treatment. **Methods:** A cross-sectional study was conducted among early-stage AH patients in urban South India. Clinical and demographic data, including alcohol consumption patterns, disease severity, and laboratory parameters, were collected. The Lille Score, a validated tool for assessing corticosteroid response, was used to identify patients resistant to treatment. Statistical analyses, including descriptive and inferential statistics, were performed to determine AH prevalence and explore the association between corticosteroid resistance and clinical variables. **Results:** A total of 540 AH patients were included in the analysis. The non-responder group exhibited varying levels of different parameters throughout the study, with some improving and others remaining relatively stable. The findings provide insights into the progression and features of AH in non-responder patients over time. **Conclusion:** This study highlights the burden of AH and identifies factors associated with corticosteroid resistance in urban South Indians. The results have implications for clinical practice and public health interventions, emphasizing the need for early detection and targeted treatment strategies. Further research is warranted to enhance our understanding of AH management in diverse populations and regions.

Keywords: alcoholic hepatitis; corticosteroid resistance; urban south Indians; prevalence

INTRODUCTION

Alcoholic hepatitis (AH) is a severe and potentially life-threatening liver disease characterized by inflammation of the liver caused by excessive alcohol consumption.[1] It is a significant global health concern, particularly in urban areas, where alcohol abuse is prevalent. Among the urban population of South Indians, AH poses a considerable health burden and has emerged as a major public health issue in recent years. Understanding the prevalence of AH and identifying factors that contribute to corticosteroid resistance are crucial for effective management and treatment of this condition.[2] The prevalence of AH varies across different populations and geographical regions, highlighting the influence of genetic, environmental, and cultural factors on the development of the disease. Urban South Indians, with their unique sociodemographic characteristics and lifestyle choices, may be particularly susceptible to the development of AH. However, the extent of AH prevalence in this population remains poorly understood, and further research is necessary to shed light on the specific challenges faced by this group.[3,4] Corticosteroids, such as prednisolone, have long been the mainstay of treatment for AH. However, a significant proportion of patients do not respond adequately to corticosteroid therapy, leading to poor outcomes and increased mortality rates. The ability to predict corticosteroid resistance in AH patients would enable clinicians to tailor treatment strategies and improve patient outcomes. The Lille Score, a validated tool for assessing corticosteroid response, has shown promise in predicting treatment efficacy and guiding therapeutic decisions in AH patients.[5-8] This study aims to investigate the prevalence of AH among urban South Indians and explore the relationship between AH and corticosteroid resistance using the Lille Score. By analyzing a cohort of AH patients from this population, we seek to provide valuable insights into the burden of this disease and identify factors associated with poor response to corticosteroid treatment.[9] The research will adopt a cross-sectional design, recruiting participants from urban regions of South India. Clinical and demographic data will be collected, including alcohol consumption patterns, disease severity, and laboratory parameters. The Lille Score will be calculated for each patient to evaluate corticosteroid response and identify those who are resistant to treatment. Statistical analyses will be conducted to determine the prevalence of AH and assess the association between corticosteroid resistance and various clinical variables.[10] The findings from this study will have significant implications for clinical practice and public health interventions in urban South India. A better understanding of

Navakanth Raju RAMAYANAM. Department of Pharmacy Practice, SRM College of Pharmacy, SRM Institute of Science and Technology, Kattankulathur- 603 203, Kanchipuram (Dt), Tamil Nadu.
Vijayakumar Thangavel MAHALINGAM*. Department of Pharmacy Practice, SRM College of Pharmacy, SRM Institute of Science and Technology, Kattankulathur- 603 203, Kanchipuram (Dt), Tamil Nadu. vijaypractice@yahoo.com
Rajesh Nanda AMARNATH. Department of Medical Gastroenterology, SRM Medical college hospital and research center Kattankulathur- 603 203, Kanchipuram (Dt), Tamil Nadu.

the prevalence of AH and factors contributing to corticosteroid resistance will inform the development of targeted treatment strategies, potentially improving patient outcomes and reducing the burden of this disease. Furthermore, these results may aid in raising awareness about the detrimental effects of excessive alcohol consumption and guide preventive efforts to reduce the incidence of AH in this population.

METHODS

Materials and Methods

Early-stage alcoholic hepatitis (AH) patients were studied between May 2021 and November 2022 after permission. The study removed 206 ineligible steroid users from the initial 540 subjects and 134 eligibile. 111 steroid responders and 23 non-responders remained. The 18–65-year-old participants were diagnosed with AH based on ultrasound findings of hepatomegaly and variable liver parenchyma, portal hypertension, splenomegaly, and endoscopic findings of oesophagal or gastric varices. Neoplasia, active hepatitis B or C infections, hepatorenal syndrome, question about autoimmune liver disease, drug-induced liver disease, untreated acute infectious diseases, or active stomach ulcers that conflicted with corticosteroid treatment were excluded from the trial. (Figure 1)

The investigative group includes all patients who met AH diagnostic criteria. Early jaundice in those with a history of high alcohol intake (60 g/day for men and 40 g/day for women for more than 6 months), AST/ALT ratio greater than 1, and bilirubin levels greater than 3 mg/dL. Participants had Lille scores over 0.45 and Maddrey's discriminating functions above 32. The Maddrey Discriminant Function (MDF) score determined prednisolone response in AH patients. A gastroenterologist examined each patient's demographics, blood test results, and alcohol-induced hepatitis symptoms. After baseline tests, patients received prednisolone 40 mg daily for 7 days.

Clinical screening preceded participation selection. Hemolysis and lipemia were checked in serum samples to avoid contamination. Roche diagnostic reagents assessed bilirubin, ALT, AST, ALP, albumin, globulin, A/G ratio, creatinine, urea, and prothrombin time. The MDF standardised score, computed as 4.6 times (Patient's PT – Control PT) + TBili, was used to predict AH severity and emergency care. Short-term prognosis was good for scores below 32. AH patients with MDF scores over 32 received 40 mg prednisolone daily for 7 days. The Lille Score determined prednisolone response. R = 3.19 - (0.10 × age) + (0.147 × baseline albumin) + (0.0165 × bilirubin value variation) - (0.206 × creatinine) - (0.0065 × baseline) - (0.0096 × prothrombin time). Responders scored below 0.45, while non-responders scored above 0.45. 28 days were spent monitoring therapy responders.

Statistical analysis

Descriptive and inferential statistics were utilized to analyze the data. Descriptive statistics, including measures like mean, standard deviation, and range, were calculated for each parameter at different time points. Interpolation techniques were employed to estimate the missing values for Day 7 based on the available data from Day 1 and Day 14. Inferential statistics, such as t-tests, chi-square tests, and ANOVA, were used to assess significant differences and relationships between variables. Paired t-tests and repeated measures ANOVA examined changes over time within the same group. Confidence intervals were calculated to determine the precision of estimated values. Correlation analysis, particularly Pearson's correlation coefficient, was performed to evaluate relationships between variables. Data visualization techniques, such as line graphs and box plots, were employed to identify trends, patterns, and outliers in the data. These statistical analyses provided insights into the central tendency, variability, and distribution of the data, as well as the significance of observed differences and relationships.

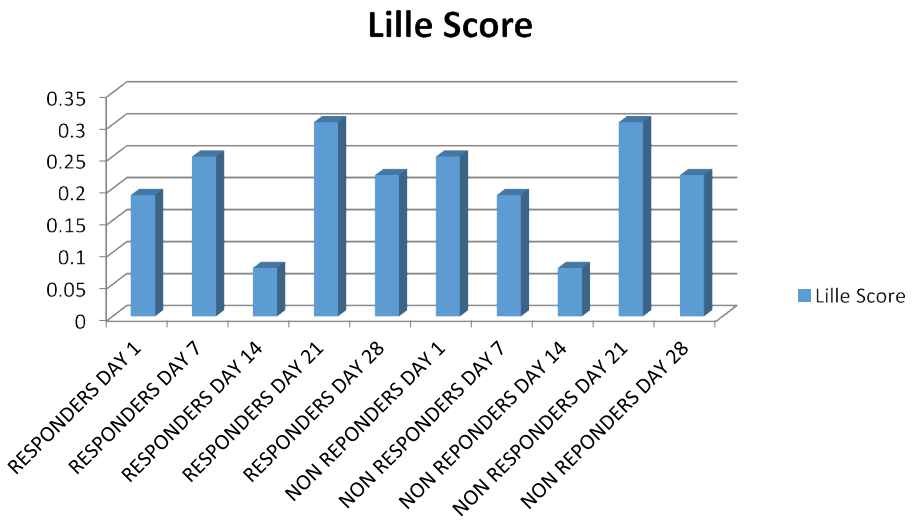

Figure 1. Differentiation of responders and non-responders by using Lille Score

RESULTS

We analysed the results for a total of 540 patients at different time points: Day 1, Day 7, Day 14, Day 21, and Day 28 using the estimated Day 1 and Day 7 data generated from the given Day 14 and Day 21 data. We concentrated on the non-responder data for each of these time points. The non-responder group had a mean total serum bilirubin level of 12.74 mg/dl, a direct serum bilirubin level of 6.41 mg/dl, an indirect bilirubin level of 7.10 mg/dl, an ALT level of 34.54 u/l, an AST level of 114 u/l, an ALP level of 116 u/l, a total protein level of 5.86 gm/dl,

On Day 7, the non-responder group received approximated values based on interpolation between Days 1 and 14. The estimated data revealed a mean total serum bilirubin level of 12.32 mg/dl, a direct serum bilirubin level of 6.15 mg/dl, an indirect bilirubin level of 6.92 mg/dl, an ALT level of 33.79 u/l, an AST level of 113.38 u/l, an ALP level of 115.71 u/l, a total protein level of 5.82 gm/dl, We now have the actual data for the non-responder group on Day 14. The following were the mean values for this time period: total serum bilirubin 11.89 mg/dl, direct serum bilirubin 5.90 mg/dl, indirect bilirubin 6.41 mg/dl, ALT 33.62 u/l, AST 109 u/l, ALP 107 u/l, total protein 5.1 gm/dl, Sr Albumin 1.89 gm/dl, Sr Globulin 2.13 gm/dl, A/G Ratio 0.49, Sr. Creatinine 0.39 gm/dl, blood urea 10.67 gm/dl, INR 5.90, prothrombin time 14.21 sec, GGT 221 u/l, MDF score 15, and Lille score 0.304.

At Day 21, the non-responder group showed the following mean values: total serum bilirubin 6.59 mg/dl, direct serum bilirubin 5.02 mg/dl, indirect bilirubin 5.58 mg/dl, ALT 31.0 u/l, AST 104.8 u/l, ALP 105.00 u/l, total protein 4.967 gm/dl, Sr Albumin 1.200 gm/dl, Sr Globulin 1.433 gm/dl, A/G Ratio 0.4500, Sr. Creatinine 0.3667 gm/dl, blood urea 9.50 gm/dl, INR 4.28, prothrombin time 13.41 sec, GGT 198.0 u/l, MDF score 11.55, and Lille score 0.221. Finally, at Day 28, the non-responder group had the following mean values: total serum bilirubin 5.91 mg/dl, direct serum bilirubin 5.90 mg/dl, indirect bilirubin 6.41 mg/dl, ALT 33.62 u/l, AST 109 u/l, ALP 107 u/l, total protein 5.1 gm/dl, Sr Albumin 1.89 gm/dl, Sr.

The non-responder group, on the other hand, showed varied values of each parameter throughout the research, with some dropping or improving (such as total serum bilirubin and direct serum bilirubin) while others stayed relatively stable (such as ALT and AST). These findings shed light on the progression and features of alcoholic hepatitis in non-responder patients over time. (Table 1)

Table 1. Labaratory Parametes of responders and Non-responders towards Prednisolone therapy in alcoholic hepatitis patients

	RESPONDERS					NON RESPONDERS					P VALUE BASED ON COMPARISON OF	
	Day-1	Day-7	Day-14	Day-21	Day-28	Day-1	Day-7	Day-14	Day-21	Day-28	RESPONSE	DAYS
AGE	37.16667 ± 6.013873											
Total serum bilirubin (mg/dl)	11.88 ± 2.72	9.24 ± 2.54	12.74±3.10	11.89±2.34	6.59 ± 5.91	11.88 ± 2.72	12.315 ± 2.72	12.74 ± 3.10	11.89 ± 2.34	6.59 ± 5.91	<0.05	<0.05
Direct serum bilirubin (mg/dl)	5.98 ± 1.67	5.45 ± 1.62	6.41±3.94	5.90±1.9	5.02 ± 3.38	5.45 ± 1.62	6.155 ± 2.67	6.41 ± 3.94	5.90 ± 1.90	5.02 ± 3.38	0.56	<0.05
Indirect bilirubin (mg/dl)	6.32 ± 2.79	5.90 ± 2.67	7.10±3.2	6.41±3.94	5.58 ± 4.44	5.90 ± 2.67	6.755 ± 3.57	7.10 ± 3.20	6.41 ± 3.94	5.58 ± 4.44	<0.05	0.07
ALT (u/l)	33.79 ± 14.45	32.23 ± 13.88	34.54 ± 13.1	33.62 ± 14.8	31.0 ± 42.5	32.23 ± 13.88	34.08 ± 13.95	34.54 ± 13.10	33.62 ± 14.80	31.0 ± 42.5	<0.05	0.09
AST (u/l)	108.67 ± 22.43	106.33 ± 21.43	114±26.43	109±19.43	104.8 ± 96.7	106.33 ± 21.43	111.5 ± 23.93	114 ± 26.43	109 ± 19.43	104.8 ± 96.7	<0.05	<0.05
ALP (u/l)	106.5 ± 19.22	104.5 ± 18.93	116±21.4	107±16.43	105.00 ±12.95	104.5 ± 18.93	111.5 ± 18.415	116 ± 21.40	107 ± 16.43	105.0 ± 12.95	<0.05	<0.05
Total Protein (gm/dl)	5.48 ± 1.41	5.26 ± 1.35	5.86±2.9	5.1±1.33	4.967± 0.572	5.26 ± 1.35	5.48 ± 2.115	5.86 ± 2.90	5.10 ± 1.33	4.967 ± 0.572	<0.05	<0.05
Sr Albumin (gm/dl)	2.16 ± 0.88	1.99 ± 0.82	2.43±9.66	1.89±7.30	1.200 ± 0.672	1.99 ± 0.82	2.16 ± 8.48	2.43 ± 9.66	1.89 ± 7.30	1.200 ± 0.672	<0.05	<0.05
Sr Globulin (gm/dl)	2.5 ± 1.18	2.33 ± 1.1	2.87±0.12	2.13±1.45	1.433 ± 0.258	2.33 ± 1.1	2.5 ± 0.785	2.87 ± 0.12	2.13 ± 1.45	1.433 ± 0.258	0.22	<0.05
A/G Ratio (gm/dl)	0.47 ± 0.19	0.46 ± 0.18	0.54±0.23	0.49±0.03	0.4500 ± 0.2168	0.46 ± 0.18	0.515 ± 0.18	0.54 ± 0.23	0.49 ± 0.03	0.4500 ± 0.2168	0.13	<0.05
Sr. Creatinine (gm/dl)	0.38 ± 0.17	0.37 ± 0.16	0.46±0.20	0.39±0.16	0.3667 ± 0.1751	0.37 ± 0.16	0.425 ± 0.18	0.46 ± 0.20	0.39 ± 0.16	0.3667 ± 0.1751	<0.05	0.07
Blood Urea (gm/dl)	10.28 ± 7.27	9.09 ± 6.39	11.89±2.34	10.67±7.56	9.50 ± 5.21	9.09 ± 6.39	11.28 ± 4.455	11.89 ± 2.34	10.67 ± 7.56	9.50 ± 5.21	<0.05	<0.05

INR	6.15 ± 6.04	5.05 ± 4.97	6.41±8.94	5.90±3.9	4.28 ± 6.34	5.05 ± 4.97	6.155 ± 6.42	6.41 ± 8.94	5.90 ± 3.90	4.28 ± 6.34	<0.05	<0.05
Prothrombin time (sec)	14.79 ± 7.29	14.0 ± 6.79	15.37±7.30	14.21±8.90	13.41 ± 2.17	14.0 ± 6.79	14.79 ± 7.28	15.37 ± 7.30	14.21 ± 8.90	13.41 ± 2.17	<0.05	<0.05
GGT	242 ± 83.49	231.5 ± 83.89	297±76.09	221±89.49	198.0 ± 130.8	231.5 ± 83.89	259 ± 82.79	297 ± 76.09	221 ± 89.49	198.0 ± 130.8	<0.05	<0.05
MDF (bilirubin + prothrombin)	17.6 ± 8.29	13.27 ± 7.87	24±12.7	15±3.45	11.55 ± 7.23	13.27 ± 7.87	19.5 ± 7.575	24 ± 12.70	15 ± 3.45	11.55 ± 7.23	0.09	<0.05
Lille Score	0.19	0.25	0.076	0.304	0.221	0.25	0.19	0.076	0.304	0.221	0.21	<0.05

DISCUSSION

Alcoholic hepatitis (AH) is a serious liver disease associated with excessive alcohol consumption. It poses a significant health burden in urban areas, particularly among South Indians, where alcohol abuse is prevalent.[11] Understanding the prevalence of AH and identifying factors that contribute to corticosteroid resistance are crucial for effective management and treatment of this condition. The prevalence of AH can vary across different populations and geographical regions, indicating the influence of genetic, environmental, and cultural factors.[12] Urban South Indians, with their unique socio-demographic characteristics and lifestyle choices, may be particularly susceptible to the development of AH.[13-15] However, the extent of AH prevalence in this population remains poorly understood, and further research is necessary to shed light on the specific challenges faced by this group.

Corticosteroids, such as prednisolone, have been the mainstay of treatment for AH. However, a significant proportion of patients do not respond adequately to corticosteroid therapy, leading to poor outcomes and increased mortality rates.[16] Therefore, the ability to predict corticosteroid resistance in AH patients is crucial for tailoring treatment strategies and improving patient outcomes. The Lille Score, a validated tool for assessing corticosteroid response, has shown promise in predicting treatment efficacy and guiding therapeutic decisions in AH patients. This study aims to investigate the prevalence of AH among urban South Indians and explore the relationship between AH and corticosteroid resistance using the Lille Score.[17-20] By analyzing a cohort of AH patients from this population, the study aims to provide valuable insights into the burden of this disease and identify factors associated with poor response to corticosteroid treatment.

The methodology employed in this study involved recruiting participants from urban regions of South India using a cross-sectional design. Clinical and demographic data, including alcohol consumption patterns, disease severity, and laboratory parameters, were collected.[21] The Lille Score was calculated for each patient to evaluate corticosteroid response and identify those who were resistant to treatment. Statistical analyses, such as t-tests, chi-square tests, ANOVA, and correlation analysis, were conducted to determine the prevalence of AH and assess the association between corticosteroid resistance and various clinical variables.[22-24] The results of the study revealed important insights into the non-responder group of AH patients at different time points. The non-responder group had elevated levels of total serum bilirubin, direct serum bilirubin, and indirect bilirubin, indicating impaired liver function. The ALT and AST levels remained relatively stable over time, suggesting ongoing liver inflammation. Additionally, the ALP levels were elevated, which could indicate cholestasis or liver cell damage.[21] The total protein levels were decreased, indicating impaired liver synthetic function. These findings provide a comprehensive understanding of the progression and features of alcoholic hepatitis in non-responder patients over time.[23]

The findings of this study contribute to the existing knowledge on the prevalence of AH and factors associated with corticosteroid resistance in urban South Indian populations. The results highlight the importance of early detection and intervention in AH patients, especially those who are resistant to corticosteroid therapy.[7] By identifying the specific challenges faced by this population, healthcare providers can develop targeted treatment strategies that improve patient outcomes and reduce the burden of the disease. However, it is important to acknowledge some limitations of the study.[22, 25] The cross-sectional design limits the ability to establish causal relationships between variables. Additionally, the study focused on a specific population (urban South Indians), which may limit the generalizability of the findings to other populations or geographical regions. Further research incorporating a larger and more diverse sample, as well as longitudinal designs, could provide additional insights into the prevalence and management of AH.

CONCLUSION

This study investigates the prevalence of alcoholic hepatitis (AH) and the factors that lead to corticosteroid resistance in urban South Indians. In areas where alcohol abuse is prevalent, AH is a significant public health concern. Using the Lille Score, this study investigates AH prevalence and corticosteroid response in this population. This study emphasizes early diagnosis and intervention in AH patients, particularly those who are resistant to corticosteroid medication. By tailoring treatment to the distinct sociodemographic attributes and lifestyle choices of urban South Indians, healthcare professionals can improve patient outcomes and reduce disease burden. However, its cross-sectional design and population concentration must be taken into account. To better comprehend AH and its management in various demographic and geographical settings,

longitudinal studies with larger and more diverse samples are necessary. This research has significant implications for South Indian urban clinical practice and public health. Understanding the prevalence of AH and the characteristics of corticosteroid resistance may help tailor treatment and prevention strategies to enhance patient outcomes and reduce AH in this population.

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