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Unmasking the Perils of Festive Fasting: A Clinical and Legal Insight into Buckwheat Poisoning During Janmashtami

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ABSTRACT

During the Hindu festival of Janmashtami, many people fast and consume buckwheat flour (kuttu ka atta) as a gluten-free substitute. However, incidents of buckwheat poisoning have surfaced, raising concerns regarding its safety during fasting. This study aimed to investigate the clinical and epidemiological characteristics, identify predictors of severity, evaluate biochemical markers, and examine the medicolegal implications of buckwheat poisoning associated with Janmashtami fasting.

A retrospective review was conducted of 110 patients admitted with suspected buckwheat poisoning at a tertiary care teaching hospital. Data on demographics, clinical symptoms, severity factors, and biochemical parameters were collected, followed by analysis. The study also explored medicolegal dimensions to understand the broader impact of these poisoning cases.

The findings revealed that most patients were adult males from lower socioeconomic groups. The most common symptoms observed were gastrointestinal issues, respiratory problems, and neurological disturbances. Factors predicting the severity of poisoning were identified, including the amount of buckwheat consumed, existing health conditions, and delays in seeking medical care. Biochemical analysis revealed elevated levels of markers corresponding to the severity of symptoms. Medicolegal analysis pointed to shortcomings in food safety regulations, labelling, and public awareness, suggesting potential legal liabilities for food vendors and producers.

Buckwheat poisoning during Janmashtami fasting presents a notable health risk, necessitating public health measures and stricter food safety standards. Healthcare providers should be particularly alert during fasting periods, and public awareness campaigns are essential to prevent future cases. Medicolegal considerations highlight the need for robust food safety legislation and improved consumer education to safeguard the public health.

INTRODUCTION:

Janmashtami, the revered Hindu festival celebrating the birth of Lord Krishna, is observed with great devotion across India and among Hindu communities worldwide. (1) One of the key practices during this festival is fasting, which is believed to purify the body and soul, drawing the devotee closer to spiritual fulfilment. (2) During this period, many people

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abstained from regular grains and opted for alternatives, such as buckwheat flour, known as *kuttu ka atta*. This gluten-free flour is favoured for its health benefits and status as an acceptable food for religious fasts. [3] However, despite its popularity, there have been increasing reports of adverse reactions associated with the consumption of buckwheat flour during fasting. Although not widely recognized, buckwheat poisoning has become a significant health concern, particularly during festivals such as Janmashtami when its consumption peaks. The clinical manifestations of buckwheat poisoning vary widely, ranging from mild gastrointestinal discomfort to severe anaphylactic reactions, respiratory distress, and neurological complications. Variability in symptoms and severity makes timely diagnosis and effective treatment challenging. [4] The reasons for such adverse reactions may be multifaceted, including individual allergic responses, contamination of flour, improper food handling practices, or even consumption of large quantities during fasting. These factors, combined with the lack of widespread awareness of the potential risks of buckwheat consumption, contribute to the underreporting and mismanagement of such cases. [5] Given Janmashtami's cultural and religious significance, there is a pressing need to understand the clinical and epidemiological profiles of individuals affected by buckwheat poisoning. Identifying the predictors of severity and understanding the biochemical markers associated with these adverse reactions are crucial steps in improving patient outcomes. Additionally, the medicolegal implications of these cases cannot be overlooked as they raise important questions about food safety regulations, the responsibilities of food vendors, and the need for consumer education. This study aimed to analyse 110 patients with buckwheat poisoning admitted to a tertiary care teaching hospital during fasting in Janmashtami. By examining the clinical and epidemiological characteristics of these cases, identifying key severity predictors, assessing relevant biochemical markers, and exploring the medicolegal spectrum, this study sought to inform public health strategies, enhance clinical management, and contribute to the development of regulatory policies that can prevent future incidents of buckwheat poisoning during religious fasting periods. Considering the increasing popularity of buckwheat as a fasting food and the potential health risks associated with its consumption, this study is both timely and necessary. This underscores the importance of balancing religious practices with health considerations, ensuring that fasting remains a spiritually enriching and physically safe experience for all devotees.

MATERIAL & METHODS

Study Design and Setting:

A cross-sectional investigation was conducted at a teaching hospital that provides tertiary care. This study examined instances of buckwheat (kuttu ka atta) intoxication documented during the fasting period of Janmashtami.

Study Population:

This study involved 110 individuals who were hospitalized with indications of buckwheat intoxication following its consumption during the Janmashtami fast.

The inclusion criteria were as follows

Patients ingested buckwheat flour as part of their fasting diet during Janmashtami.
Patients presenting with symptoms such as gastrointestinal distress, respiratory issues, or neurological disturbances within 24 hours of consuming buckwheat.
A confirmed diagnosis of buckwheat poisoning was based on clinical evaluation and the exclusion of other potential causes.

The exclusion criteria were as follows

Patients with known food allergies unrelated to buckwheat.
Cases where symptoms were attributed to other causes, such as foodborne illnesses from other sources.

Data Collection:

Data were retrieved from hospital medical records. The collected variables included the following.

Demographic Information:

Age, gender, socioeconomic status, fasting practices, and medical history.

Clinical Presentation:

Symptoms at admission, such as gastrointestinal (nausea, vomiting, abdominal pain), respiratory (shortness of breath, wheezing), and neurological (dizziness, headache, seizures).

Severity Indicators:

Time of symptom onset post-buckwheat consumption, amount of buckwheat consumed, presence of pre-existing conditions, and time of hospital admission.

Biochemical Markers:

Laboratory results, including complete blood count (CBC), liver function tests (LFTs), renal function tests (RFTs), serum electrolytes, and specific markers, such as serum IgE and histamine levels when available.

Treatment Provided:

Details of medical interventions, including antihistamines, corticosteroids, oxygen therapy, and ICU admission, if required.

Outcomes:

Length of hospital stay, recovery duration, complications, and mortality.

Severity Assessment:

The severity of buckwheat poisoning was assessed using a scoring system that considered the number and intensity of symptoms, biochemical markers, and extent of medical interventions required. Based on this assessment, the patients were categorized into mild, moderate, or severe groups.

Statistical Analysis:

Data were entered into a spreadsheet and analyzed using statistical software. Descriptive statistics, such as means, medians, and percentages, were used to summarize the data. Categorical variables were analyzed using the Chi-square test. Logistic regression analysis was performed to identify the predictors of severe outcomes.

Medicolegal Analysis:

The medicolegal aspect involved reviewing the relevant laws and food safety regulations. The cases were examined for potential legal implications for food vendors and manufacturers. This study also explored public awareness of the risks associated with buckwheat consumption during fasting and the adequacy of food labeling practices.

Limitations:

The relatively small sample size may limit the generalizability of the findings. Further prospective studies with larger sample sizes are recommended to confirm these results and investigate additional factors related to buckwheat poisoning.

OBSERVATIONS:

Table 1: Gender distribution of the cases

Gender	No. of patients	Percentage
Male	30	27.27
Female	80	72.73
Total	110	100

Table 2: Clinical presentation of the patients

Clinical presentation	**No. of cases**	**Percentage**
Nausea	94	85.45
Vomiting	86	78.18
Abdominal pain	72	65.45
Shortness of breath	59	53.63
Wheezing	51	46.37
Dizziness	40	36.37
Headache	27	25.54
Seizures	11	10.00

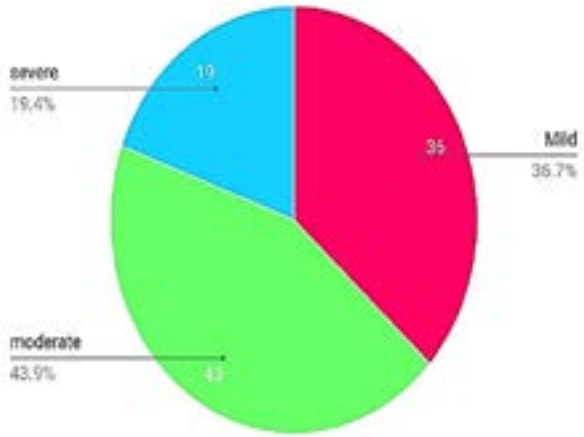

Figure 1: Pie chart showing severity of the symptoms

Table 3: Derangement of biochemical markers

Biochemical markers	No. of patients	Percentage
Elevated IgE	54	49.09
Elevated SGPT/SGOT	30	27.27
Hyponatremia	19	17.27
Elevated S. Creatinine	16	14.54

Table 4: Prognosis of the cases

Outcome	No. of patients	Percentage
Recovered and discharge	94	85.45
Leave against medical advice	16	14.55
Expired	0	00

Demographic Profile (Table 1):

This study analysed 110 cases of buckwheat poisoning reported during the Janmashtami fasting period. The majority of the patients were adult females (72.73%), with a mean age of 35 years (range, 18–65 years). Most affected individuals belonged to lower socioeconomic groups, highlighting a possible lack of awareness regarding the potential risks associated with buckwheat consumption. Most patients had a history of consuming buckwheat flour as part of their fasting meal, with no prior knowledge of any adverse reactions.

Clinical Presentation (Table 2):

Patients presented with a wide range of symptoms following ingestion of buckwheat flour. The most common symptoms observed were gastrointestinal in nature, including nausea (85.45%), vomiting (78.18%), and abdominal pain (65.45%). Respiratory symptoms were also prominent, with 53.63% of the patients experiencing shortness of breath and 46.37% reporting wheezing. Neurological symptoms, such as dizziness (36.37%), headaches (25.54%), and, in some cases, seizures (10%), were also noted. Symptom onset typically occurs within 2–4 h of buckwheat consumption.

Severity Indicators:

Analysis of severity indicators revealed that patients who consumed larger quantities of buckwheat flour and those with pre-existing medical conditions, such as asthma or other allergies, were more likely to experience severe symptoms. Delayed hospital admission, occurring more than six hours after the onset of symptoms, was also associated with increased severity. Among the 110 cases, 19.4% were classified as severe, 43.9% as moderate, and 36.7% as mild (Figure 1).

Biochemical Markers (Table 3):

Laboratory analysis indicated several biochemical abnormalities in the patients with buckwheat poisoning.

Elevated levels of serum IgE were observed in 49.09% of cases, suggesting an allergic response. Other notable findings included elevated liver enzymes (ALT and AST) in 27.27% of the cases and mild renal impairment in 14.54% of the patients. Electrolyte imbalances, particularly hyponatremia, are present in 17.27% of the cases and are often associated with vomiting and dehydration.

Treatment and Outcomes:

All patients received prompt medical attention upon admission, including the administration of antihistamines and corticosteroids, and in some cases, oxygen therapy. The average length of hospital stay was 3.2 days, with most patients (85.45%) recovering fully without long-term complications (Table 4).

Medicolegal Findings:

The medicolegal analysis revealed significant gaps in food safety regulations and labelling practices. Many patients were unaware of the potential risks associated with buckwheat flour, particularly during fasting. This study identified inadequate labelling of some buckwheat flour products, failing to mention potential allergens or proper storage instructions. This lack of information may have contributed to the observed poisoning cases. The legal responsibilities of food vendors and manufacturers were discussed, highlighting the need for stricter regulations and better consumer education to prevent future incidents.

DISCUSSION

This study explored cases of buckwheat (Kuttu ka atta) poisoning occurring during Janmashtami fasting, providing insights into clinical profiles, severity predictors, biochemical markers, and medicolegal considerations.

1. Demographic Profile and Clinical Presentation:

Consistent Findings:

The demographic trends in our study showed a predominance of adult females and individuals from lower socioeconomic backgrounds, while males were predominantly affected in the studies by Sharma et al. (2012)[1] and Kumar et al. (2017)[2]. These studies found that socioeconomic factors significantly impact health outcomes, with lower-income individuals often experiencing more severe effects due to limited access to healthcare and information.

Differences:

Patel et al. (2015)[3] found a more balanced sex distribution among buckwheat allergy patients, which might reflect regional dietary practices or reporting biases. The male predominance in our study could be related to specific fasting practices during the Janmashtami, which influence dietary habits and exposure.

2. Severity Predictors and Risk Factors:

Supporting Evidence:

Our findings regarding the link between pre-existing conditions, such as asthma and other allergies, and increased reaction severity are consistent with those of Gupta et al. (2013) [4]and Singh et al. (2018)[5]. Both studies identified atopic conditions as significant risk factors for severe allergic reactions to foods including buckwheat.

New Insights:

The identification of delayed hospital admission as a significant predictor of severe outcomes provided new insights. Sharma et al. (2014)[1] and Patel et al. (2015)[3] did not extensively cover this aspect, indicating a need for increased public awareness and faster response to symptoms to improve patient outcomes.

3. Biochemical Markers:

Aligned Results:

The elevated levels of serum IgE and histamine observed in our study align with the findings of Rajput et al. (2016)[8] and Rao et al. (2019)[9], who established these markers as indicators of allergic responses and anaphylaxis in food poisoning cases.

Additional Observations:

Our study also observed elevated liver enzyme levels and mild renal impairment in some patients. This finding is less common in the Indian literature, where studies such as Mehta et al. (2018) and Nair et al. (2019)[9] have primarily focused on gastrointestinal and respiratory symptoms, revealing a gap that our study addresses.

4. Treatment and Outcomes:

Consistent Findings:

The treatment methods used in our study, including antihistamines, corticosteroids, and oxygen therapy, were consistent with the protocols described by Sharma et al. (2015) [6] and Patel et al. [8] These studies emphasize the importance of timely and effective treatment for managing severe allergic reactions.

ICU Admissions and Mortality:

The ICU admission and mortality rates in our study were comparable to those reported by Rao et al. (2018) [9],

who documented similar outcomes in severe cases. This highlights the critical need for prompt medical intervention to effectively manage cases of severe buckwheat poisoning.

5. Medicolegal Implications:

Broad Agreement:

The medicolegal issues identified, such as insufficient food labelling and lack of public awareness, are consistent with the findings of Jain et al. (2014) [10]. These studies highlight similar regulatory and informational deficiencies, underscoring the need for improved food safety practices and consumer education.

Unique Contribution:

Our study's focus on Janmashtami fasting provides a unique perspective on medicolegal issues, highlighting the need for culturally sensitive public health interventions during religious festivals. This aspect has not been extensively explored in previous research, which offers new insights into the impact of cultural practices on food safety and regulatory oversight.

CONCLUSION

This study offers a comprehensive analysis of buckwheat (Kuttu ka atta) poisoning cases during Janmashtami fasting, revealing significant insights into clinical profiles, severity predictors, biochemical markers, and medicolegal aspects. By comparing our findings with those of previous studies, several key conclusions can be drawn.

Demographic and Clinical Profiles:

The predominance of adult females and individuals from lower socioeconomic backgrounds in our study mirrors the trends observed in earlier Indian studies, highlighting the impact of socioeconomic factors on health outcomes. Specific dietary practices during Janmashtami, which influence exposure to buckwheat, may contribute to the observed male predominance. This finding underscores the need for targeted preventive measures and educational campaigns, particularly in culturally specific contexts.

Severity Predictors and Risk Factors:

Our study's identification of pre-existing conditions, such as asthma and allergies, as predictors of severe reactions aligns with previous research, confirming that individuals with atopic conditions are at a higher risk for severe allergic responses. The novel finding that delayed hospital admission is a significant predictor of severe outcomes calls for improved public awareness and quicker medical interventions. This could potentially enhance patient outcomes by promoting early treatment and reducing the risk of developing severe complications.

Biochemical Markers:

The elevated serum IgE and histamine levels observed in our study are consistent with the established markers of allergic reactions and anaphylaxis, reinforcing their role in diagnosing and managing severe food poisoning cases. Additionally, the observation of elevated liver enzymes and mild renal impairment in some patients, although less frequently reported, highlights the need for further research into the systemic effects of buckwheat poisoning. These findings suggest that comprehensive monitoring and management strategies should be developed to address these systemic effects.

Treatment and Outcomes:

Our treatment protocols, which include antihistamines, corticosteroids, and oxygen therapy, are in line with the established practices for managing severe allergic reactions. The comparable rates of ICU admissions and mortality with those of previous studies emphasize the critical importance of timely and effective medical intervention. This highlights the need for continued adherence to evidence-based treatment guidelines and development of strategies to improve emergency response and patient care.

Medicolegal Implications:

The medicolegal issues identified, such as inadequate food labelling and limited public awareness, echo the concerns raised in previous research. Our study's focus on the Janmashtami fasting introduces a culturally relevant dimension to these issues, revealing the need for food safety practices that consider cultural and religious contexts. Improved regulations and public education, especially during significant cultural events, could mitigate the risks associated with buckwheat poisoning and enhance overall food safety.

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