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**Dr. Shailendra Singh Rajpoot**  
MD Medicine, Metro Hospital  
and Cancer Research Center,  
Jabalpur, Madhya Pradesh,  
India

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**Assessment of tetany in 80 adult patients**

**Dr. Shailendra Singh Rajpoot**

**Abstract**

**Background:** Tetany is a disorder with an extremely variable clinical presentation. It includes enhanced neuromuscular activity and associated sensory disturbance. The present study was conducted to evaluate the cases of tetany in adults.

**Materials and Methods:** 80 cases of tetany of both genders were included. Etiology and clinical features of tetany was recorded.

**Results:** Out of 80 patients, males were 44 and females were 36. Common causes were anxiety hyperventilation in 20, Bartter's syndrome in 5, vitamin deficiency in 25, acute pancreatitis in 6, idiopathic hyperparathyroidism in 10 and hypomagnesaemia in 4. The difference was significant ( $P < 0.05$ ). Common symptoms were cramps in 56, paresthesia of hand and feet in 60, laryngeal stridor in 35, carpopedal spasm in 52, circumoral numbness in 24 and muscle twitching in 17 patients. The difference was significant ( $P < 0.05$ ).

**Conclusion:** Various causes of tetany are acute pancreatitis, vitamin D deficiency, recurrent vomiting etc.

**Keywords:** Laryngeal stridor, tetany, hypomagnesaemia

**Introduction**

Tetany is categorized by variable combinations of features comprising cramps, muscle twitching, circumoral numbness, paresthesias of hands and feet, laryngeal stridor, carpopedal spasm, and convulsions. Tetany can be understood as a hyperexcitability of the axons of peripheral nerves leading to the generation of repetitive discharges<sup>[1]</sup>.

Tetany is a disorder with an extremely variable clinical presentation. It includes enhanced neuromuscular activity and associated sensory disturbance. Mild symptoms may include circumoral numbness, muscle cramps, or paresthesias of hands and feet<sup>[2]</sup>. In severe cases, patients may present with laryngospasm, generalized muscle cramps, seizures, or even myocardial dysfunction. Trousseau sign and Chvostek sign are clinical tests to unmask latent tetany. The increased excitability of the peripheral nerves is due to either a low serum calcium (true hypocalcemia denotes a decrease in the ionized calcium level even though the total serum calcium level may be normal) or alkalosis in which the proportion of the serum calcium in the ionized form is decreased<sup>[3]</sup>.

Hyperventilation can be defined as a state in which breathing in excess of metabolic requirements results in hypocapnia. Many medical and psychiatric conditions can lead to this condition<sup>[4]</sup>. The individual manifestations of hypocapnia vary widely, but symptoms can include paresthesias in the face, trunk, and extremities, fasciculations, and tetany, among others<sup>[5]</sup>. Causes of tetany may vary in different geographic locations according to the prevalence of diseases. However, studies describing the etiological distribution of tetany are rarely found in literature except case reports or case series of individual diseases<sup>[6]</sup>. The present study was conducted to evaluate the cases of tetany in adults.

**Materials and Methods**

The present study was conducted on 80 cases of tetany of both genders. All were informed regarding the study and their written consent was obtained.

General information such as name, age, gender etc. was recorded. A thorough clinical

**Corresponding Author:**  
**Dr. Shailendra Singh Rajpoot**  
MD Medicine, Metro Hospital  
and Cancer Research Center,  
Jabalpur, Madhya Pradesh,  
India

examination was performed. Serum phosphate, alkaline phosphatase, serum magnesium and intact parathyroid hormone level was estimated. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was

considered significant.

**Results**

**Table 1:** Distribution of patients

Total-80		
Gender	Males	Females
Number	44	36

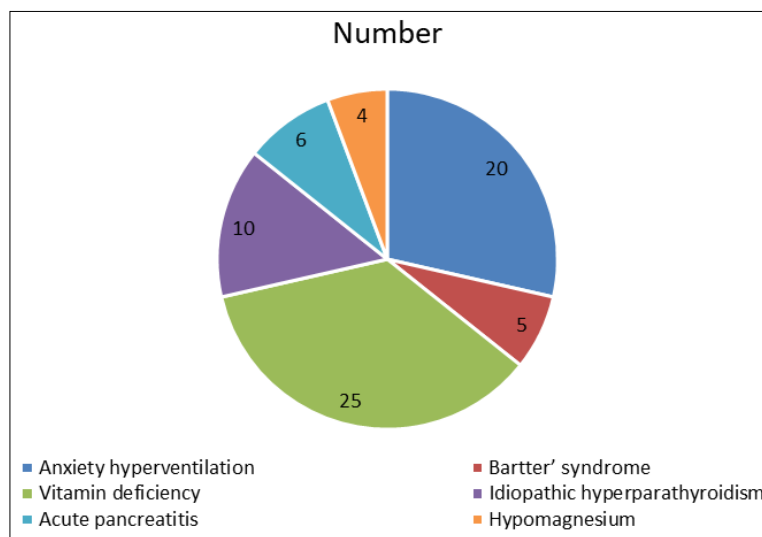
Table I shows that out of 80 patients, males were 44 and females were 36.

**Table 2:** Etiology of tetany

Etiology	Number	P value
Anxiety hyperventilation	20	0.01
Bartter' syndrome	5	
Vitamin deficiency	25	
Idiopathic hyperparathyroidism	10	
Acute pancreatitis	6	
Hypomagnesium	4	

Table II, graph I shows that common causes were anxiety hyperventilation in 20, Bartter' syndrome in 5, vitamin deficiency in 25, acute pancreatitis in 6, idiopathic

hyperparathyroidism in 10 and hypomagnesaemia in 4. The difference was significant ( $P<0.05$ ).



**Fig 1:** Etiology of tetany

**Table 3:** Symptoms in patients

Symptoms	Number	P value
Cramps	56	0.01
Paresthesia of hand and feet	60	
Laryngeal stridor	35	
Carpopedal spasm	52	
Circumoral numbness	24	
Muscle twitching	17	

Table II shows that common symptoms were cramps in 56, paresthesia of hand and feet in 60, laryngeal stridor in 35, carpedal spasm in 52, circumoral numbness in 24 and muscle twitching in 17 patients. The difference was significant ( $P<0.05$ ).

**Discussion**

Tetany is characterized by variable combinations of features including circumoral numbness, muscle twitching, cramps, paresthesias of hands and feet, carpedal spasm, laryngeal

stridor, and convulsions (due to cerebral vasoconstriction) [7]. Trousseau sign (carpedal spasm observed following application of inflated blood pressure cuff over brachial artery 20 mmHg above systolic blood pressure for 3 min) and Chvostek sign (twitching of circumoral muscles with tapping on facial nerve below zygomatic process 2 cm anterior to earlobe) unmask latent tetany in patients with tingling, numbness, and cramps in extremities [8]. The decrease in serum calcium causing tetany is well known. However, decrease in ionized calcium is more important than total calcium level, as it is the biologically active component. In different causes of tetany, total serum calcium may be normal when ionized calcium is low [9]. Tetany is caused by low calcium level in blood. Low ionized calcium levels in the extracellular fluid increase the permeability of neuronal membranes to sodium ion, causing a progressive depolarization, which increases the possibility of action potentials. This occurs because calcium ions interact with the exterior surface of sodium channels in the

plasma membrane of nerve cells<sup>[10]</sup>. The present study was conducted to evaluate the cases of tetany in adults.

In present study, out of 80 patients, males were 44 and females were 36. Santra *et al.*<sup>[11]</sup> in their study patients with overt or latent tetany were evaluated clinically and from laboratory investigations. Initial investigations done were serum calcium, potassium, and arterial blood gas analysis. Both ionized and total calcium were assessed and corrected according to serum albumin level. Depending on initial reports, further tests were done such as serum phosphate, alkaline phosphatase, parathyroid hormone and magnesium levels; and urine potassium, calcium and chloride levels. Gitelman's syndrome (GS), Bartter's syndrome (BS), recurrent vomiting, anxiety hyperventilation, Vitamin D3 deficiency (VDD), idiopathic hypoparathyroidism (IHP), postoperative hypoparathyroidism (PHP), acute pancreatitis, tumor lysis syndrome (TLS), and hypomagnesemia were the different causes of tetany identified. Out of 53 patients, total serum calcium was normal in 41 patients with metabolic or respiratory alkalosis (GS, BS, recurrent vomiting, and anxiety hyperventilation). Total calcium was low only in 12 patients (in VDD, IHP, PHP, acute pancreatitis, TLS, and hypomagnesemia). Ionized calcium was low in all patients. GS was the most common (38%). Recurrent vomiting (19%), anxiety hyperventilation (13%), and VDD (11%) were also common. PHP was less common (4%); acute pancreatitis, TLS, hypomagnesemia, and IHP were uncommon.

We found that common causes were anxiety hyperventilation in 20, Bartter's syndrome in 5, vitamin deficiency in 25, acute pancreatitis in 6, idiopathic hyperparathyroidism in 10 and hypomagnesaemia in 4. Esra *et al.*<sup>[12]</sup> in their study found Gitelman's syndrome (GS), Bartter's syndrome (BS), recurrent vomiting, anxiety hyperventilation, vitamin D3 deficiency (VDD), idiopathic hypoparathyroidism (IHP), postoperative hypoparathyroidism (PHP), acute pancreatitis, tumor lysis syndrome (TLS) and hypomagnesemia as different causes of tetany. Out of 106 patients, total serum calcium was normal in 82 patients with metabolic or respiratory alkalosis. Total calcium was low only in 24 patients. Ionized calcium was low in all patients. GS was the most common (38%). Recurrent vomiting (19%), anxiety hyperventilation (13%), and VDD (11%) were also common. PHP was less common (4%); acute pancreatitis, TLS, hypomagnesemia and IHP were uncommon.

The most common cause of tetany is decreased calcium ion concentration, but the literature reports numerous cases of normocalcemic tetany in the context of hyperventilation<sup>[13]</sup>. This is due to alkalosis causing a change in the relative amounts of bound versus free calcium ions in the plasma. This interpretation has been supported by the frequent observation that normocalcemic patients with tetany still present with Chvostek's sign or a positive Trousseau test, both generally considered indicative of low calcium<sup>[14]</sup>.

## Conclusion

Authors found that Various causes of tetany are acute pancreatitis, vitamin D deficiency, recurrent vomiting etc.

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