



# International Journal of Advanced Community Medicine

E-ISSN: 2616-3594  
P-ISSN: 2616-3586  
IJACM 2019; 2(3): 183-185  
Received: 20-07-2019  
Accepted: 24-08-2019

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## Assessment of cases of tetany in adults

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**DOI:** <https://doi.org/10.33545/comed.2019.v2.i3c.102>

### Abstract

**Background:** The present study was conducted to assess the cases of tetany in adult population of both genders.

**Materials and methods:** The present study was conducted on 78 cases of tetany of both genders. A thorough clinical examination was performed in patients.

**Results:** Out of 78 patients, males were 48 and females were 30. Clinical features in patients were cramps in 56, paresthesia of hand and feet in 48, laryngeal stridor in 49, carpopedal spasm in 70, circumoral numbness in 52 and muscle twitching in 67. The difference was non-significant ( $P > 0.05$ ). Reason of tetany was recurrent vomiting seen in 26, Bartter's syndrome in 15, anxiety hyperventilation in 10, vitamin deficiency in 12, acute pancreatitis in 5, idiopathic hyperparathyroidism in 3 and hypomagnesaemia in 2. The difference was significant ( $P < 0.05$ ).

**Conclusion:** Authors found that reason of tetany was recurrent vomiting, Bartter's syndrome, anxiety hyperventilation, vitamin deficiency, acute pancreatitis, idiopathic hyperparathyroidism and hypomagnesaemia.

**Keywords:** Hypomagnesaemia, tetany, vomiting

### Introduction

Tetany is categorized by variable combinations of features comprising cramps, muscle twitching, circumoral numbness, paresthesia 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<sup>[2]</sup>. Mild symptoms may include circumoral numbness, muscle cramps, or paresthesia of hands and feet. 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>.

Nonetheless, decrease in ionized calcium is more significant than total calcium level, as it is the biologically active component. In different causes of tetany, total serum calcium can be normal when ionized calcium was low. Awareness regarding the etiological spectrum of tetany is very poor amid physicians. Studies on the etiological distribution of tetany are rare in literature<sup>[4, 5]</sup>. The present study was conducted to assess the cases of tetany in adult population of both genders.

### Materials and Methods

The present study was conducted in the department of Internal Medicine. It comprised of 78 cases of tetany of both genders. The study was approved from institutional ethical committee. All were informed regarding the study and informed written consent was obtained.

General information such as name, age, gender etc. was recorded. A thorough clinical examination was performed. Clinical features such as vomiting, polyuria, polydipsia, weakness of limbs, anxiety disorder, drug intake, abdominal pain, thyroid and neck surgeries and chemotherapy for malignant disorders were obtained. Patients were subjected to serum calcium, albumin, ABG, sodium, potassium, serum phosphate, alkaline phosphatase,

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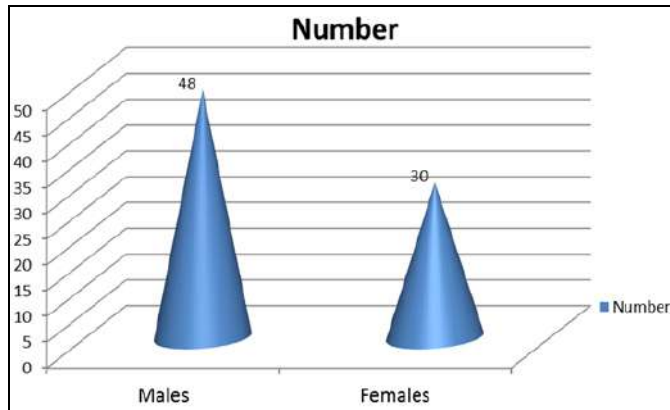
serum magnesium and intact parathyroid hormone level. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

**Results**

**Table 1:** Distribution of patients

Total- 78		
Gender	Males	Females
Number	48	30

Table 1, graph 1 shows that out of 78 patients, males were 48 and females were 30.

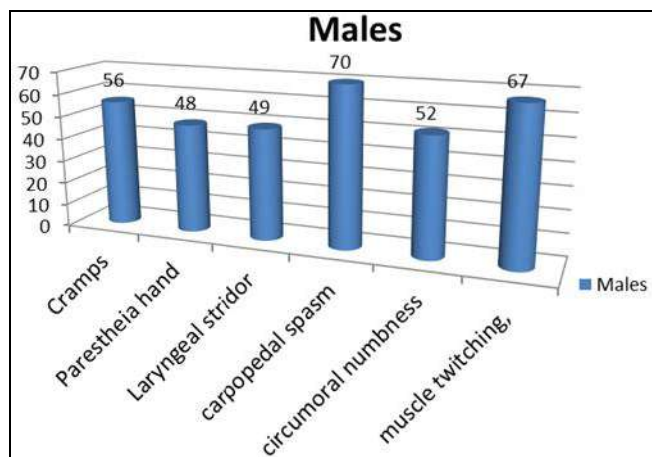


**Graph 1:** Distribution of patients

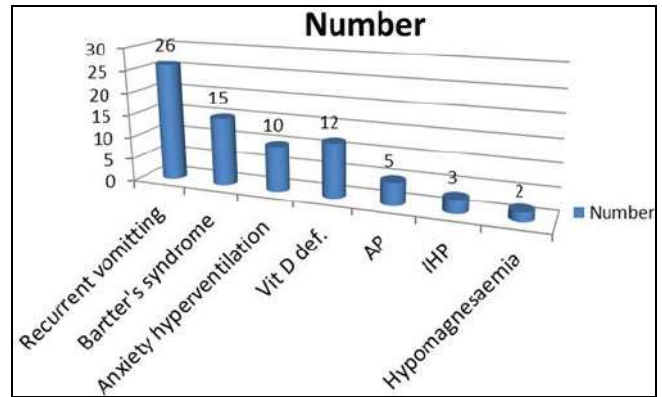
**Table 2:** Clinical features in patients

Clinical features	Number	P value
Cramps	56	0.06
Paresthesia of hands and feet	48	
Laryngeal stridor	49	
Carpopedal spasm	70	
Circumoral numbness	52	
Muscle twitching	67	

Table 2, graph 2 shows that clinical features in patients were cramps in 56, paresthesia of hand and feet in 48, laryngeal stridor in 49, carpopedal spasm in 70, circumoral numbness in 52 and muscle twitching in 67. The difference was non-significant ( $P > 0.05$ ).



**Graph 2:** Clinical features in patients



**Graph 3:** Etiologies of tetany

Graph 3 shows that reason of tetany was recurrent vomiting seen in 26, Bartter' syndrome in 15, anxiety hyperventilation in 10, vitamin deficiency in 12, acute pancreatitis in 5, idiopathic hyperparathyroidism in 3 and hypomagnesaemia in 2. The difference was significant ( $P < 0.05$ ).

**Discussion**

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 [6]. This occurs because calcium ions interact with the exterior surface of sodium channels in the plasma membrane of nerve cells [7]. The present study was conducted to assess the cases of tetany in adult population of both genders.

In present study, out of out of 78 patients, males were 48 and females were 30. 8. Gandhi *et al.* [8]. found that 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 106 patients, total serum calcium was normal in 82 patients with metabolic or respiratory alkalosis (GS, BS, recurrent vomiting, and anxiety hyperventilation). Total calcium was low only in 24 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 clinical features in patients were cramps in 56, paresthesia of hand and feet in 48, laryngeal stridor in 49, carpopedal spasm in 70, circumoral numbness in 52 and muscle twitching in 67. 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. 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>[9]</sup>.

We found that reason of tetany was recurrent vomiting seen in 26, Bartter' syndrome in 15, anxiety hyperventilation in 10, vitamin deficiency in 12, acute pancreatitis in 5, idiopathic hyperparathyroidism in 3 and hypomagnesaemia in 2. Richardson *et al.*<sup>[10]</sup> found that Gitelman's syndrome (GS), Bartter's syndrome (BS), recurrent vomiting, anxiety hyperventilation, Vitamin D<sub>3</sub> 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.

### Conclusion

Authors found that reason of tetany was recurrent vomiting, Bartter' syndrome, anxiety hyperventilation, vitamin deficiency, acute pancreatitis, idiopathic hyperparathyroidism and hypomagnesaemia.

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