

Spasmophilia in the Cardiological Outpatient Department: A Retrospective Study of 228 Sub-saharan Africans over 5 Years

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Abstract

Background: Spasmophilia also called latent tetany is a disorder with a very heterogeneous clinical manifestation which affects particularly young women. Chest pain, constriction of the throat and palpitations are symptoms common to spasmophilia and ischaemic heart disease (IHD). The objective of this work was to assess the incidence and to study the epidemiological, clinical features of spasmophilia in patients with symptoms of ischaemic heart disease.

Methods: This was a retrospective study conducted at the cardiology Department of Military Hospital of Ouakam, in Dakar, Senegal, from January 1st 2009 to December 31st 2014). We included all patients who were admitted with manifestation of ischaemic heart disease and who subsequently had a negative evaluation for IHD. We observed the occurrence of neuromuscular hyperexcitability, assessed with Electromyographic (EMG) test. We collected and analyzed epidemiological, clinical, and outcomes data of Powered by Editorial Manager® and ProduXion Manager® from Aries Systems Corporation 228 patients.

Results: The incidence of spasmophilia in patient's referred with symptoms of ischaemic heart disease was 20% and 100% in patients with normal ECG findings. The mean age of patients was 28.70 ± 18 years with a sex ratio (F/M) of 13.41. The most common presenting symptoms were dominated by chest pain (90%). a history of Insomnia was found in 31 patients (13.60%), and affective disorders were found in 55 patients (24.12%). Biochemical investigation revealed decreased serum magnesium in 5.26%. Medical examinations were normal. All patients were treated with magnesium lactate. 80.60% of patients reported after 3 months complete regression of complaints. 17.20% of patients continued to experience complaints with a significant improvement in terms of reduced frequency and intensity. No complications were noted in our patients after 12 months follow-up.

Conclusion: Despite its feary common occurrence, spasmophilia is rarely recognized. We recommend to add EMG test to the algorithm of examinations of patients with chest pain and normal ECG.

Keywords: Spasmophilia; Chest pain; Electromyographical test; Magnesium deficiency

Background

Spasmophilia also called latent tetany and recently referred to as the central neuronal hyper excitability syndrome (NHS) is a disorder with a very heterogeneous clinical manifestation. It includes neuromuscular hyperactivity, decreased attention, fatigue, constant anxiety, chest pain etc. [1].

Spasmophilia affects particularly young women [2]. A noncharacteristic clinical picture and the lack of a pathognomonic symptom, cause that despite of the feary common occurrence, spasmophilia is rarely recognized.

Chest pain is the most common reason for referral of patients for acute medical admission. Prompt and accurate diagnosis is very important but our ability to differentiate between the patient with a life-threatening cardiac condition and someone with non-cardiac discomfort still depends primarily on clinical acumen plus interpretation of the ECG and the chest radiograph.

Chest pain, constriction of the throat and palpitations are symptoms common to spasmophilia and ischemic heart disease (IHD) [3]. Henceforth, it becomes difficult to distinguish between them as there is considerable overlapping of symptomatology.

The objective of this work was to assess the incidence and to study the epidemiological, clinical features of spasmophilia in patients with symptoms of ischemic heart disease presenting in the cardiology department.

Methods

This was a retrospective study conducted at the cardiology and Internal medicine Department of Military Hospital of Ouakam, in Dakar, Senegal, over a period of 5 years (January 1st 2009 to December 31st 2014).

We include all patients who were admitted with manifestation of ischemic heart disease such: chest pain, constriction of throat, palpitation and dyspnea and who subsequently had a negative evaluation for IHD. A metabolic cause of tetany was ruled out.

We observed the occurrence of neuromuscular hyper excitability, assessed with Electromyographic (EMG) recordings of the first interosseous muscle on the right arm. The test was considered positive when, after the strap of the sphygmomanometer had been loosened, spontaneous motor unit discharges in sequences of triplets and multiplets waves were observed. The test was considered negative when a silent electromyographical trace was recorded.

We collected and analyzed epidemiological, clinical, paraclinical and outcomes data of patients.

We studied data on age, gender, psychological factors. We also noted the time delay between the onset of symptoms and final diagnosis. All patients had a complete physical examination and a laboratory assessment with emphasis on the level of serum magnesium and calcium.

On the ECG we looked for suggestive electrocardiographic changes, rhythm and conduction abnormalities. Doppler echocardiography was performed for all patients to evaluate the left ventricle (LV) wall motion, LV ejection fraction and pericardial involvement. We also looked for rib fractures, pleural effusion and signs of venous stasis on the chest X-ray. Salt magnesium, calcium and anxiolytics therapy were evaluated.

The studied parameters were entered into an electronic questionnaire using Epi info version 6.0 of the World Health Organization. Data analysis was performed using SPSS (Statistical Package for Social Sciences). Quantitative data were expressed as mean \pm standard deviation. Qualitative data were expressed as percentage.

These hormones have been shown to increase the occurrence of cell death via apoptosis in germ cells located at specific stages of the seminiferous epithelial cycle.

Results

- We included 228 patients. 211 patients (92.54%) were females and 17 patients (7.46%) were males giving a sex ratio (F/M) of 13/41.
- The mean age of patients was 28.7 ± 18 years with a range of 6 and 59 years. In women, the mean age was 28 years and among men it was 34 years. Most of patients (58.77%) were under 30 years.
- EMG test was positive for all patients.
- The Diagnosis latency i.e., the interval from the onset of symptoms to the definite diagnosis of latent tetany was 6.4 months.
- The most common presenting symptoms (Table 1) were dominated by chest pain (90%), palpitations (81%) and shortness of breath (42.9%) Association of chest pain and palpitations was found in 92 patients (40.35%).

Symptoms	Number	%
Chest pain	205	90
palpitations	184	81
Shortness of breath	98	42.9
Muscle cramps	60	26.3
headaches	28	12.3
Loss of consciousness	5	2.2

Table 1: Symptoms found in our patients.

- A history of Insomnia was found in 31 patients (13.60%) and panic attacks in 5 patients (2.19%).
- Mood and affective disorders were found in 55 patients (24.12%).
- Biochemical investigation with emphasis on the level of serum magnesium and calcium revealed a decreased serum magnesium and calcium respectively in 5.26% and 1.31%.
- Successive ECG was normal. Echocardiography and chest X-ray were normal for all patients. Exercise tests and coronarography were performed in 5 patients with typical chest pain and cardiac risk factors with a negative outcome examination. ECG holter recording, performed in all patients with palpitations, was normal.
- All patients were treated with magnesium lactate and calcium by the oral route. Anxiolytics were given to patients with sleep and mood disorders.
- Psychological evaluation and psychotherapy were designated for patients with panic attacks.
- 80.6% of patients reported after 3 months complete regression of complaints. This favorable outcome was higher (79.2%) in the group of patient diagnosed as spasmophilic before 6 months from the onset of symptoms versus 40% in those with late diagnosis.
- 17.2% of patients continued to experience complaints with a significant improvement in terms of reduced frequency and intensity.
- 5 patients (2.2%) were sent for treatment in a psychiatric outpatient unit.
- No complications were noted in our patients after 12 months follow-up.

Discussion

In our study, the incidence of spasmophilia in patients referred with symptoms of ischemic heart disease was 20% and 100% in patients with normal ECG findings. Data on the incidence of spasmophilia are rare in Africa. In the literature there is a lack of precise data concerned which most probably results from its underestimation.

The mean age of patients was 28.7 ± 18 years with a range of 6 and 59 years. In women, the mean age was 28 years and among men it was 34 years. In Japan, 508 patients were reported to range in age from 5-85 years. Spasmophilia was particularly prevalent among women in their late teens and among men in their twenties [4]. The young age of patients with spasmophilia was also reported by Torunska [5].

Our study confirms female predominance as has been emphasized in previous works [3-6].

Chest pain was found to be the main symptoms. Although chest pain is a common clinical syndrome, there is a paucity of African studies describing the causes, prevalence and disposition of patients with chest pain. However Geysler, in a study conducted in the emergency department (ED) of a regional hospital in Pretoria found that most of patients with chest pain of non-cardiac origin were black Africans (75%). In this study, regarding age, patients with cardiovascular disease tend to be older than the average, with a mean age of 55.07 years while patients with psychological disorders were younger than the average, with a mean age of 29.86 years and such patients were most often females (85.71%) [7]. Sullivan found that the diagnosis of normal coronary artery in patients referred with chest pain, was five times more common in women than men [8]. In Czech, Sovova found that 50% of patients referred for chest pain with negative coronarography findings had spasmophilia [3].

In our study, all patients with chest pain had normal ECG findings. Despite the fact that studies of several decades ago reported a 3% to 10% incidence of acute myocardial infarction in patients presenting to the ED with chest pain and a normal ECG [9,10], it seems that such patients have low rates of mortality and cardiac complications [11].

Clinically, spasmophilia in Africans does not appear much different from that of European countries [3,5,12,13].

In our study, shortness of breath was found in 42.9% of patients. Shortness of breath in patients with spasmophilia is related to hyperventilation syndrome (HVS) which is characterized by functional hyperventilation attacks with no underlying organic abnormality. HVS is particularly prevalent among young women [4]. Traditionally, it has been considered that hyperventilation attacks spontaneously disappear regardless of their severity. In our study, we encountered five patients with HVS who experienced apnea and loss of consciousness. Spontaneous respiration re-started without treatment within one minute.

Apnea and loss of consciousness in patients with HVS have been reported by Munemoto [14], Inagaki [15] and MacDonald [16] and were related to post hyperventilation apnea (PHA). In most cases, patients spontaneously recover from PHA within one or two minutes without any clinical problems, but cases with prolonged PHA was reported as an example of near fatal instance of PHA [16]. PHA has been reported to be due to a decreased PaCO₂. Hypocapnia caused by hyperventilation presents the condition of alkalosis in which, reduced hydrogen acting on the chemoreceptors lead to the suppression of breathing [17].

Indeed, most works on the occurrence spasmophilia have a disease pattern dominated by the absence of organic abnormalities. This is reflected in our work where medical examinations including chest X-ray, ECG, echography, excise testing; holter ECG and coronarography were normal.

The pathophysiological basis of spasmophilia is frequently magnesium deficiency and the therapeutic administration of magnesium salts has usually a favorable effect. However the parameters of magnesium balance are not always consistent with the results of electromyography.

Vizinova found in his study that in 72% of patients there was agreement of the positivity of the EMG and magnesium deficiency (i.e. reduced values of ery-Mg and U-Mg), positivity of EMG combined with normal parameters of the Mg balance was recorded in 18% [18]. Mazzotta, in his study, found that the majority of migraine patients (93.30%) with neuromuscular hyper excitability had red blood cell levels of magnesium below the norm [19].

In our study, there was no relationship between serum magnesium level and positivity of the EMG.

This difference is probably due to the superiority of the determination of Mg⁺⁺ levels in erythrocytes not only as a sensitive indicator of magnesium nutritional status, but also as an indirect marker of muscular excitability, compared to the magnesium concentration in other body compartments such as mononuclear cells and particularly serum [1,20,21].

Spasmophilia, demonstrated by positive results of EMG tests was associated in previous research with high levels of mood disturbances [22,23]. In our study, mood and affective disorders were present in 21.12% of patients. Panic attack was found in 2.19%. The symptoms of

panic disorder according to the diagnostic criteria DSM-III [24] are, except a few, virtually identical with those of spasmophilia. In a group of 20 patients treated for panic disorder, Taborska found a concomitant incidence of latent tetany with known etiology and decreased levels of intracellular magnesium in 18 (90%) [25].

Despite its common occurrence, it happens that spasmophilia is diagnosed too late and therefore insufficiently cured as noted in our study where diagnosis latency was 6.4 months.

The impact of therapy with magnesium salts on improvement of spasmophilic patients, as noted in our work, has been emphasized by most of authors.

Conclusion

Spasmophilia is a disorder with a very heterogeneous clinical manifestation. A noncharacteristic clinical picture and the lack of a pathognomonic symptom, cause that despite of the fearly common occurrence, spasmophilia is rarely recognized.

Electromyography examination is regarded as the most sensitive method in the diagnostic spectra at disposal and with regard to the high rate of positive EMG tests in patients with a history of chest pain and a negative evaluation for IHD, we recommend to add this simple test to the algorithm of examinations of these patients particularly in young women.

References

1. Cristina S, Sandrini G, Riuz L, Verri AP, Musico M, et al. (1996) A record card for the study of neuronal hyper excitability syndrome. *Funct Neurol* 11: 53-58.
2. Horenstein M (1986) Spasmophilia or panic attack? *Presse Med* 15: 1230-1236.
3. Sovova E, Skvarilova M, Bartousek J, Doupal V, Lukl J, et al. (1999) Latent tetany in patients with a negative coronarographic finding. *Vnitr Lek* 45: 291-294.
4. Hirokawa Y, Kondo T, Ohta Y, Kanazawa O (1995) Clinical characteristics and outcome of 508 patients with hyperventilation syndrome. *Nihon Kyobu Shikkan Gakkai Zasshi* 33: 940-946.
5. Torunska K (2003) Tetany as a difficult diagnostic problem in the neurological outpatient department. *Neurol Neurochir Pol* 37: 653-664.
6. Nuti R, Turchetti V, Martini G, Righi G, Galli M, et al. (1987) Pathophysiological aspects of calcium metabolism in spasmophilia. *Biomed Pharmacother* 41: 96-100.
7. Geysler M, Smith S (2016) Chest pain prevalence, causes, and disposition in the emergency department of a regional hospital in Pretoria. *Afr J Prim Health Care Fam Med* 8: 1048.
8. Sullivan AK, Holdright DM, Wright CA, Sparrow JL, Cunningham D, et al. (1994) Chest pain in women: clinical, investigative, and prognostic features. *BMJ* 308: 883-886.
9. Slater DK, Hlatky MA, Mark DB, Fejr H, Pryor DB, et al. (1987) Outcomes in suspected acute myocardial infarction with normal or minimally abnormal admission ECG findings. *Am J Cardiol* 60: 766-770.
10. Rouan GW, Lee TH, Cook EF, Brand DA, Weisberg MC, et al. (1989) Clinical characteristics and outcomes in patients with initially normal or non-specific electrocardiograms. *Am J Cardiol* 64: 1087-1092.
11. Forest SF, Shofer FS, Sease KL, Hollander JE (2004) Assessment of the standard reporting guidelines ECG classification system: the presenting ECG predicts 30-day outcomes. *Ann Emerg Med* 44: 206-212.
12. Gryglas A, Dudkowiak R, Smigiel R (2015) Tetany as a frequent cause of an emergency consultations-etiology, symptoms and cure. *Przegl Lek* 72: 20-24.

13. Delvaux M, Fontaine P, Bartsch P, Fontaine O (1998) Tetany, spasmophilia, hyperventilation syndrome: theoretical and therapeutic synthesis. *Rev Med Liege* 53: 610-618.
14. Munemoto T, Masuda A, Nagai N, Tanaka M, Yuji S (2013) Prolonged post-hyperventilation apnea in two young adults with hyperventilation syndrome. *BioPsychoSocial Medicine* 7: 9.
15. Inagaki T, Horiguchi J, Mizuno S, Kanata K, Miyaoka T, et al. (2004) Breath-holding spells in somatoform disorders. *Int J Psychiatry Med* 34: 201-205.
16. MacDonald KF, Bowers JT, Flynn RE (1976) Post-hyperventilation apnea associated with severe hypoxemia. *Chest* 70: 554-557.
17. Haldane JS, Priestley JG (1905) The reregulation of lung-ventilation. *J physiol* 32: 225-266.
18. Vizzinova H, Bartousek J, Bartek J (1997) Magnesium balance in patients with spasmophilia. Relation to results of electromyography. *Cas Lek Cesk* 136: 448-450.
19. Mazzota G, Sarchielli P, Cittadini E, Gallai V (2003) Electromyographical ischemic test, clinical symptoms related to neuromuscular hyperexcitability, and intra-extracellular Mg⁺⁺ levels in headache. *J Headache Pain* 4: 24-30.
20. Durlach J, Poenarus S, Roumani S, Bara M, Guit-Bara A (1987) The control of central neural hyperexcitability in magnesium deficiency. *Karger*: 48-71.
21. Limas CJ (1971) The role of magnesium in muscle contraction. *Rev Eur Etud Clin Biol* 16: 311-315.
22. Sarchielli P, Coata G, Firenze C, Morucci P, Abbritti G, et al. (1992) Serum and salivary magnesium levels in migraine and tension-type headache, results in a group of adult patients. *Cephalgia* 12: 21-27.
23. de Romanis F, Feliciani M, Rosati MV, Jandolo B, Pietrangeli A, et al. (1987) Spasmophilia: A clinical neurophysiopathological and biochemical study. *Funct Neurol* 2: 239-246.
24. Davies J (2016) How voting and consensus created the diagnostic and statistical manual of mental disorders (DSM-III) *Anthropol Med*. 21: 1-15.
25. Táborská V (1995) Incidence of latent tetany in patients with panic disorder. *Cesk Psychiatr* 91: 183-190.