



JOURNAL OF THE HEARTBEAT CLINIC CARDIOLOGY

- **Vitamin B12 Deficiency in POTS patients**
- **Hypothyroidism in POTS patients**
- **Prevalence of Depression and Anxiety in POTS patients**
- **Temperature Intolerance as a common symptom in POTS Patients**



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JOURNAL OF THE HEARTBEAT CLINIC CARDIOLOGY

Welcome to the Second Edition of The Heartbeat Clinic Journal.

The Heartbeat Clinic has been serving the community as a leading Cardiac Facility for over a decade. It is known for offering state-of-the-art services. It is also well-reputed for its research as well as its educational pursuits.

The Heartbeat Clinic Journal is another step in our mission to serve and bring awareness to our community regarding the newest discoveries and researches in the field of medicine.

Sincerely,

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Editor-in-Chief

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JOURNAL OF THE HEARTBEAT CLINIC CARDIOLOGY



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CONTENTS

- PAGE 7** Temperature Intolerance as a Common Symptom in Postural Orthostatic Tachycardia Syndrome (POTS) Patients
- PAGE 8** Cerebrospinal Fluid Leak in Postural Orthostatic Tachycardia Syndrome (POTS) Patients
- PAGE 9** Hypothyroidism in Postural Orthostatic Tachycardia Syndrome (POTS) Patients
- PAGE 10** Psychotropic Drugs in Postural Orthostatic Tachycardia Syndrome (POTS) Patients
- PAGE 11** Depression in Patients with Postural Orthostatic Tachycardia Syndrome (POTS)
- PAGE 12** Prevalence of Anxiety in Postural Orthostatic Tachycardia Syndrome (POTS) Patients
- PAGE 13** Intravenous Saline Providing Symptomatic Relief for Patients with Postural Orthostatic Tachycardia Syndrome (POTS)
- PAGE 14** Symptom relief from Median Arcuate Ligament Syndrome corrective surgery in patients with Postural Orthostatic Tachycardia Syndrome (POTS) and Median Arcuate Ligament Syndrome
- PAGE 15** Coagulopathies in Postural Orthostatic Tachycardia Syndrome (POTS)
- PAGE 16** DROXIDOPA Management in Postural Orthostatic Tachycardia Syndrome (POTS) Patients
- PAGE 17** Median Arcuate Ligament Surgery in Postural Orthostatic Tachycardia Syndrome (POTS) -Is Post-Operative Celiac Artery Velocity (POCAV) a Success Marker?
- PAGE 18** Effects of Ivabradine on Autonomic Parameters in Postural Orthostatic Tachycardia Syndrome (POTS) Patients
- PAGE 19** Autonomic Parameters in POTS Patients Before and After Median Arcuate Ligament Syndrome Surgery
- PAGE 20** POTS and its associated Chronic Pain Symptoms
- PAGE 21** Gastrointestinal Disturbances in POTS
- PAGE 22** Vitamin B12 Deficiency Study in Postural Orthostatic Tachycardia Syndrome (POTS)
- PAGE 23** Vitamin D Deficiency Study in Postural Orthostatic Tachycardia Syndrome (POTS)



CONTENTS

- PAGE 24** Endometriosis in Postural Orthostatic Tachycardia Syndrome (POTS)
- PAGE 25** Ehlers–Danlos syndrome (EDS) and its Associated Dermatologic Symptoms
- PAGE 26** Balance Disorders in Postural Orthostatic Tachycardia Syndrome (POTS)
- PAGE 27** Frequency of Symptoms in Postural Orthostatic Tachycardia Syndrome (POTS)
- PAGE 28** A Comprehensive Study on Postural Orthostatic Tachycardia Syndrome (POTS) Symptoms



DR. SULEMAN AND TEAM AT A SCIENTIFIC CONFERENCE



SERVICES OFFERED AT THE HEARTBEAT CLINIC

HOLTER MONITORING

Holter monitoring is available for all of our patients. Using a 12-lead holter, we can often localize the site of origin of many arrhythmias. Holter monitors also allow us to perform heart rate variability studies.

TILT TABLE TESTING

The Heartbeat Clinic does tilt table tests right in our office. We use beat-by-beat blood pressure monitoring for our tilts. Usually, we measure cardiac output and thoracic fluid content using Impedance cardiography.

PULMONARY FUNCTION TESTING

Patients who are on amiodarone require serial pulmonary function tests. In order to avoid variations, we complete our own pulmonary function tests with diffusion capacity of carbon mono-oxide (DLCO). If you are a patient of The Heartbeat Clinic, and you are on amiodarone, you will more than likely have the dose of your medicine adjusted by the time you walk out of our office due to our comprehensive testing. We correct your DLCO using our own point-of-care hemoglobin testing.

LIVER FUNCTION TESTING

We do point-of-care liver function testing for our patients who are on anti-cholesterol medication and amiodarone. This is a simple finger stick test.

THYROID FUNCTION TESTING

Point-of-care qualitative thyroid stimulating hormone (TSH) analysis is available.

LIPID PROFILES

Through a series of tests, The Heartbeat Clinic is able to create a lipid profile that will determine a patient's risk for coronary heart disease.

COUMADIN CLINIC

The Coumadin Clinic is for patients who have atrial fibrillation or some other health concern that necessitates taking Coumadin. The Coumadin Clinic is run on site by our Nurse Practitioner and qualified staff.

AUTONOMIC NERVOUS SYSTEM TESTING

We analyze cardiac response to various physiological stimuli. To this end, we can determine inspiration to expiration ratio, posture index, and Valsalva ratio. Watch our video here at Autonomic Nervous System.



SIGNAL AVERAGE ELECTROCARDIOGRAM (EKG) TESTING:

This special type of electrocardiogram is sometimes required to assess a patient's risk for life-threatening arrhythmias. We are the only practice in the area that provides Signal Average EKG Testing.

P-WAVE SIGNAL AVERAGING

This is new technology still undergoing clinical research. It is used to measure high-resolution signals in the upper chamber of the heart. The Heartbeat Clinic uses it primarily for research purposes with defibrillators.

IMPEDANCE CARDIOGRAPHY

This technique measures the cardiac output and stroke volume, the amount of blood pumped per heartbeat, non-invasively. We use it for autonomic function testing, assessment of shortness of breath, and for fine-tuning our pacemakers.

STRESS TESTING

We perform both chemical and exercise stress tests. Assessment of Forearm Blood Flow: This is a research technique used to study arterial inflow in forearm blood vessels. We use Hokanson equipment for this purpose.

CAROTID DOPPLER

This technique is used to evaluate the risk of sudden death. The leads are hooked up, and then the patient is asked to walk on a treadmill. The heart rate is kept between 100 and 110 for two minutes and 30 seconds, and then between 110 and 120 for one minute and 30 seconds. This is a new test still undergoing clinical research.

MICROVOLT T-WAVE ALTERNANS TESTING

This technique is used to evaluate the risk of sudden death. The leads are hooked up, and then the patient is asked to walk on a treadmill. The heart rate is kept between 100 and 110 for two minutes and 30 seconds, and then between 110 and 120 for one minute and 30 seconds. This is a new test still undergoing clinical research.

24-HOUR BLOOD PRESSURE MONITORING

We have ability to do 24-hour blood pressure monitoring for all of our patients. We do this to diagnose white coat hypertension and create a work up of low blood pressure or blood pressure that is easily changed.

CONTRAST ECHOCARDIOGRAPHY

State-of-the-art contrast echocardiography is used to rule out clots inside the heart. We are the only practice in the area with the ability to use this technique.

METABOLIC STRESS TESTING

This testing technique is invaluable in terms of assessing the cause of unexplained shortness of breath. We are the only practice in North Dallas to perform this test. It gives us the ability to pre-screen patients.

TEMPERATURE INTOLERANCE AS A COMMON SYMPTOM IN POTS

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INTRODUCTION

Postural Orthostatic Tachycardia Syndrome (POTS) is a disorder of the Autonomic Nervous System where the body loses the functional capability to maintain the rhythm of the heart at equilibrium as the body changes positions. POTS is a subset of orthostatic intolerance that is associated with the presence of excessive tachycardia on standing. It has a higher prevalence in females. Thermoregulation is a function of the autonomic nervous system that controls the amount of heat loss at the periphery by regulating the peripheral blood flow and circulation. The aim of this study is to identify the correlation between temperature intolerance and Postural Orthostatic Tachycardia Syndrome (POTS).

METHODS

83 patients with POTS, who are treated at our syncope and arrhythmia center, were randomly selected to fill a Temperature intolerance questionnaire containing “Yes or No” questions about having heat intolerance, cold intolerance, excessive sweating and the presence of medically associated conditions (Hypothyroidism, Hyperthyroidism, Anorexia, Menopause, Anemia, Multiple Sclerosis, Systemic Lupus Erythematosus, Hashimoto’s Thyroiditis, Raynaud’s Syndrome).

RESULTS

57 patients out of 83 patients, are females (68.67%, n = 57), 26 are males (31.32%, n = 26). A total of 79 out of 83 (95.43%) patients had Temperature Intolerance in general, 43 (52%) had both Cold and Heat Intolerance, 20 (24.09%) had Cold Intolerance alone, 16 (19.27%) had Heat Intolerance alone, 50 (60.24%) had Excessive Sweating. 16 (19.2%) had Hypothyroidism, 1 (1.2%) had Hyperthyroidism, 0 (0%) had Anorexia, 2 (2.4%) had Menopause, 14 (16.8%) had Anemia, 0 (0%) with Multiple Sclerosis, 0 (0%) had Systemic Lupus Erythematosus, 4 (4.8%) had Hashimoto’s Thyroiditis, 11 (13.25%) had Raynaud’s Syndrome).

CONCLUSION

This study shows a high incidence of temperature intolerance in patients with POTS, which may be due to the disorder of the autonomic nervous system associated with POTS. In POTS patients the highest incidence is of those who are both cold and heat intolerant, therefore indicating that POTS patients have a general oversensitivity to temperature.

CEREBROSPINAL FLUID LEAK IN POTS PATIENTS

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INTRODUCTION

POTS is a form of dysautonomia that is characterized by postural dizziness, syncope, palpitations, fatigue, shortness of breath, headaches; primarily affecting young women. The symptoms of POTS are widespread because the autonomic nervous system plays an extensive role in regulating functions throughout the body. On the other hand cerebrospinal fluid (CSF) leak is a condition that occurs when the CSF leaks through a defect in the dura through a hole or a tear causing positional headaches. Possible causes of the hole or tear can include head injury, connective tissue disorders and brain or sinus surgery. The incidence of the CSF leak is now about 5 in 100,000 per total population¹.

OBJECTIVE

The aim of this study is to determine the presence of CSF leak in patients with POTS and the association of it with the symptoms exacerbation.

METHODS

A retrospective study done on 798 POTS patients was conducted from June 2014 till September 2017. We reviewed the medical records of 798 POTS patients for the presence of CSF Leak in those patients.

RESULTS

We found out of 798 POTS patients 5 patients with mean age of 36.6 +/- 5.435 years, are diagnosed with CSF leak with multiple testing's (office based pressure test, MRI brain and Myelogram). Those 5 patients had an exacerbation of the following symptoms: Headache and Dizziness, comparing with other POTS patients. 3 out of the 5 patients are diagnosed with EDS. 1 patient is being managed with high volume blind blood patches and 1 patient had the leak surgically repaired. Those 2 patients did not show an improvement in their POTS symptoms including the headache and the dizziness after the leak was repaired.

CONCLUSION

Our study suggests CSF leak should be considered as a rare cause in the POTS and EDS patients with orthostatic headaches, as well as the incidence of CSF leak appears to be significantly higher in patients with EDS and POTS compared to that of the general population.

Reference: Spontaneous Intracranial Hypotension Neil Gordon; First published: 2 November 2009, DOI:10.1111/j.1469-8749.2009.03514.x

HYPOTHYROIDISM IN POTS PATIENTS

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INTRODUCTION

POTS is a condition of dysautonomia characterized by abnormal increments in heart rate upon assumption of the upright posture accompanied by symptoms of cerebral hypoperfusion and sympathoexcitation. An increase in heart rate equal to or greater than 30 BPM or to levels higher than 120 BPM during a head-up tilt test is the main diagnostic criterion. The symptoms of pots are widespread because the autonomic nervous system plays an extensive role in regulating functions throughout the body. However, hypothyroidism is a common condition of thyroid hormone deficiency. Clinical manifestations of hypothyroidism range from serious life threatening symptoms to no signs or symptoms. The most common symptoms in adults are fatigue, lethargy, cold intolerance, weight gain, constipation, change in voice, and dry skin, but clinical presentation can differ with age and sex, among other factors. The standard treatment is thyroid hormone replacement therapy with Levothyroxine.

OBJECTIVE

The aim of this study is to determine co-dominance and association between POTS and Hypothyroidism as those patients have shared symptoms including fatigue, temperature intolerance, bradycardia, and muscle aches.

METHODS

A retrospective study done on 798 POTS patients was conducted from June 2014 till September 2017. We reviewed the medical records for 798 POTS patients for Hypothyroidism.

RESULTS

Out of 798 POTS patients we found 125 out of 678 (18.43%) females with the mean age of 37.981 +/- 12.368 were diagnosed with Hypothyroidism. We also found 12 out of 114 males (10.52%) with the mean age 40.666 +/- 16.408 who were also diagnosed with hypothyroidism. The patients have been consistently taking their hypothyroidism drugs, however have not seen improvements in their POTS symptoms.

CONCLUSION

Our study has shown that some patients with hypothyroidism might not show improvement in their symptoms are obscured because of the presence of POTS. These patients need additional attention and specific management for their POTS condition.

PSYCHOTROPIC DRUGS IN POTS

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INTRODUCTION

Postural Orthostatic Tachycardia Syndrome (POTS) is primarily a disease of young females, affecting approximately 1,000,000 and 3,000,000 Americans, and millions more around the world. We frequently found usage of psychotropic drugs in POTS patients. Selective Serotonin Reuptake Inhibitors (SSRI)s, Anti-depressants, Benzodiazepines and others are prescribed to manage psychological illnesses. Most commonly the condition is depression and/or anxiety that may occur secondary to having a chronic medical disease, or in association with POTS. The aim of this study is to identify the incidence of using psychotropic drugs in patients with Postural Orthostatic Tachycardia Syndrome (POTS).

METHODS

792 patients were selected randomly from our clinic with POTS. Patients' drug histories were reviewed from their electronic records. Psychotropic drugs found are: Selective Serotonin Reuptake Inhibitors SSRIs (Sertraline, Fluoxetine, Escitalopram, Citalopram, Paroxetine); Serotonin and Epinephrine Reuptake Inhibitors SNRIs (Cymbalta, Effexor); Serotonin Antagonist and Reuptake Inhibitors SARI (Trazadone); Tricyclic Anti-depressants TCAs (Amitriptyline & Nortriptyline); Atypical Anti-Depressants (Wellbutrin, Mirtazapine, Ambien); Anti-Psychotics (Quetiapine, Risperdal, Aripiprazole); Anti-Epileptics (Clonazepam, Topiramate, Lamotrigine); Benzodiazepines (Alprazolam, Lorazepam, Diazepam, Temazepam); CNS stimulants (Amphetamine Salts, Methylphenidate, Lisdexamefetamine, Guanfacine) and Neuropathy medications (Gabapentin, Pregabalin).

RESULTS

Out of the total 792 patients, 292 (36.86%) are prescribed to psychotropic drugs; 76 (25.68% out of total) are SSRIs users { Sertraline (10.27% of total, n=30), Fluoxetine (8.56% of total, n=25), Escitalopram(4.11% of total, n=12), Citalopram(2.05% of total, n=6), Paroxetine(1.027% of total, n=3) }. 21 (7.19% out of total) are SNRIs users { duloxetine (5.13% of total, n = 15), Venlafaxine (2.05% , n = 6). 33 (11.30 % out of total) are SARI users { Trazadone (11.30% n = 33) }. 17 (2.14% of total) are TCAs users { Amitriptyline (4.45% of total, n = 13), Nortriptyline (1.37% of total, n = 4) }. 14 (4.79% of total) are atypical Anti-Depressants users { Bupropion (2.39% of total, n = 7), Mirtazapine(1.71% of total, n = 5), Zolpidem (0.68% of total, n = 2) }. 12 (1.51% of total) are Anti-Psychotics users {Quetiapine (1.36% of total, n = 4), Risperidone (1.027% of total, n = 3), Aripiprazole (1.71% of total, n = 5)}. 81 (27.73% of total) are Anti-Epileptics users {Clonazepam (6.3% of total, n = 47), Topiramate (16.095% of total, n = 21), Lamotrigine (4.450% of total, n =13)}. 87 (29.79% of total) are Benzodiazepines users { Alprazolam (17.12% of total, n =50), Lorazepam (6.84% of total, n = 20), Diazepam (5.47% of total, n = 16), Temazepam (0.34% of total, n = 1) }. 52 (19.84% of total) are CNS stimulants users { Amphetamine (13.35% of total, n = 35), Methylphenidate (1.52% of total, n = 4), Lisdexamefetamine(3.81% of total, n = 10), Guanfacine (1.14% of total, n = 3) }. 34 (11.64% of total) are ANnetiu-ral pain medications users {Gabapentin (11.30% of total, n = 33,) Pregabalin(0.16% of total, n=1)

CONCLUSION

Our research results demonstrated that Postural Orthostatic Tachycardia Syndrome (POTS) patients have significantly a higher incidence of psychotropic drug use (36.86%).

DEPRESSION IN PATIENTS WITH POTS

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BACKGROUND

POTS is form of Dysautonomia associated with a heterogeneous array of symptoms and many other Co-morbidities. POTS is frequently misdiagnosed for other conditions because it commonly presents with concomitant symptoms that mimic those associated with those conditions. Many POTS patients come in having previously seen a Psychiatrist. Previous research data has shown how POTS can impair one's quality of life physically, mentally, and socially¹. The symptoms of POTS are vast because the Autonomic Nervous System plays an extensive role in regulating various functions and pathways throughout the body. The aim of this study is to determine the incidence of depression present in POTS patients.

METHODS

792 POTS patients were randomly selected from our clinic. Patients' electronic medical records were reviewed retrospectively for the diagnosis of depression. Inclusion criteria for POTS patients was a positive Tilt table test and abnormal Autonomic function tests; Depression based on DSM IV criteria (Pre-diagnosed from Psychiatric Clinics).

RESULTS

Out of 792 patients, 85.6% are Female (678) and 14.4% are Male (114). 9.72% of those 792 patients are diagnosed with Depression (77); out of which 92.9% are Female (71) and 7.792% are Male (6). All POTS patients were asked about social and psychological factors on initial and subsequent follow up visits.

CONCLUSION

Depression can lead to poor quality of life which is one of the associated symptoms in POTS patients and detailed history and examination should be carried out for proper treatment and improvement of quality of life in POTS patients.

PREVALENCE OF ANXIETY IN POTS PATIENTS

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BACKGROUND

POTS is form of Dysautonomia associated with a heterogeneous array of symptoms and many other co-morbidities. POTS is frequently misdiagnosed for other conditions because it commonly presents with concomitant symptoms that mimic those associated with those conditions. In the past, it was mistakenly believed to be caused by Anxiety. However, modern researchers have determined that POTS is not caused by Anxiety^{2,4,5}. Many POTS patients come in having previously seen a Psychiatrist and already having been diagnosed with General Anxiety Disorder or Panic Attacks. Research has shown that POTS patients are similarly or even less likely to suffer from Anxiety or panic disorder than the general public^{1,3,4,5}. Previous research data has shown how POTS can impair one's quality of life physically, mentally, and socially¹. The symptoms of POTS are vast because the Autonomic Nervous System plays an extensive role in regulating various functions and pathways throughout the body. The symptoms of POTS are vast because the Autonomic Nervous System plays an extensive role in regulating functions throughout the body. The aim of this study is to determine the frequency of Anxiety present in POTS patients.

METHODS

792 POTS patients were randomly selected from our clinic. Patients' electronic medical records were reviewed retrospectively for diagnosis of Anxiety.

RESULTS

Out of 792 POTS patients, 85.6% are female (678) and 14.4% are male (114). 25.75% of those 792 patients are diagnosed with Anxiety (204); out of which 86.3% are female (176) and 13.7% are male (28).

CONCLUSION

POTS patients are often misdiagnosed with Anxiety as many of the symptoms overlap. Our data suggests that even after having this overlap, patients are separately diagnosed with POTS (Tilt table test criteria) and anxiety (DSM IV criteria). POTS symptoms should not be neglected by diagnosing with Anxiety. Further clinical studies are required to broaden the area of these discrepancies.

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4. Excessive heart rate response to orthostatic stress in postural tachycardia syndrome is not caused by anxiety; Masuki S, Eisenach JH, Johnson C et al. Applied Physiology 2006; 102: 1134-42.
5. Experimental induction of panic-like symptoms in patients with postural tachycardia syndrome; Khurana RK, Clinical Autonomic Research 2006;

INTRAVENOUS SALINE PROVIDING SYMPTOMATIC RELIEF FOR PATIENTS WITH POTS

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OBJECTIVE

The purpose of this study is to help in understanding of the symptomatic relief achieved by administering IV Saline in patients with POTS.

INTRODUCTION

Postural Orthostatic Tachycardia Syndrome (POTS) is a form of disorder of the Autonomic Nervous System. The female to male ratio about 5:1. POTS is associated with a variety of symptoms like headache, light-headedness, fatigue, palpitations, exercise intolerance, abdominal discomfort, near syncope and recurrent syncope on upright position, diaphoresis and sleep disorder. It appears that blood pooling in the veins of the lower body is a major factor in most POTS patients. This study shows that IV Saline helps in improving fatigue, dizziness, trouble concentrating and head/neck discomfort symptoms in POTS patients.

METHODS

15 female patients with POTS treated at our syncope and arrhythmia center were given a questionnaire to fill about the severity of their symptoms of fatigue, dizziness (lightheadedness, feeling faint or might black out), head/neck discomfort and trouble concentrating before taking 1-2 liters of IV fluids. Patient were evaluated within 24-48 hours of taking the IV Saline treatment and interviewed in their next follow up appointments to verify any changes in those symptoms.

RESULTS

13 patients out of 15 indicated improvement in fatigue for 2-3 days after the IV Saline treatment. 11 patients out of 15 indicated improvement in dizziness (lightheadedness, feeling faint or might black out) in the 2-3 days after IV Saline treatment. 9 patients out of

12 with trouble concentrating indicated improvement in this symptom after IV Saline treatment. 6 out of 13 with head/neck discomfort indicated improvement in their symptom of head/neck discomfort after the IV Saline treatment.

CONCLUSION

Patients with Postural Orthostatic Tachycardia Syndrome who are treated with IV Saline have shown improvement in the severity of their symptoms of fatigue, dizziness, trouble concentrating and head/neck discomfort most noticeable in the 2-3 days after IV Saline treatment.

SYMPTOM RELIEF FROM MEDIAN ARCUATE LIGAMENT SYNDROME CORRECTIVE SURGERY IN PATIENTS WITH POTS AND MEDIAN ARCUATE LIGAMENT SYNDROME

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BACKGROUND

The Median Arcuate Ligament Syndrome (MALS) is a condition characterized by abdominal pain attributed to compression of the celiac artery and possibly the celiac ganglia by the median arcuate ligament. Postural Orthostatic Tachycardia Syndrome (POTS) affects primarily young women. POTS is a form of dysautonomia that is estimated to impact between 1,000,000 and 3,000,000 Americans and millions more around the world. Previous study demonstrated that >15% of POTS pts (pts) were found to have MALS. The purpose of this research is to evaluate the outcome of MALS Surgery on POTS and MALS symptoms.

METHODS

480 pts with POTS were selected from electronic medical records from February 2016 to February 2017. Of those, 100 also had the MALS diagnosis. 22 out of the 100 elected to have surgery done to correct the MALS syndrome. All 22 pts had their ligament separated to relieve the compression of the celiac artery.

RESULTS

22 pts with POTS and MALS had the surgery performed. 14% were males (n=3; age 20.66 ± 4.72). 86% were females (n=19; age 27.31 ± 9.48). Overall, 11 (50%) of the pts reported overall improvement, predominantly a reduction in palpitations and bloating; 10 (45%) reported improvement in shortness of breath and chest pain; 9 (40%) reported less nausea; 8 (36%) reported less abdominal pain; 7 (31%) reported less dizziness; 4 (18%) reported less fatigue; 3 (13%) pts reported improvement in appetite and 2 (9%) pts reported fewer episodes of headache and vomiting. Only 1 patient reported no improvement after MALS surgery.

CONCLUSION

Our study reports that 50% of the pts who underwent MALS surgery reported an improvement in their symptoms. Half of the improvement was in the autonomic symptoms and the other half was in the gastrointestinal symptoms. Further studies need to be performed to solidify the 50% benefit of MALS surgery

COAGULOPATHIES IN POTS

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BACKGROUND

Coagulopathy is a disruption in the body's ability to control blood clotting which results in either hemorrhage or thrombosis. Postural Orthostatic Tachycardia Syndrome is a condition which is estimated to affect 1 million to 3 million Americans. This study aims to evaluate the incidence of coagulopathies among POTS patients.

METHODS

638 POTS patients were selected retrospectively from June 2014 to March 2017. Patients with conditions that predisposed to coagulopathies & those who had coagulation profiles done for various reasons were reviewed comprehensively.

RESULTS

35 (5%) patients had conditions which predisposed to coagulation disorders. 6% were males (n=2) and 94% were females (n=33). 8 (23%) patients had Factor V Leiden; 7 (8%) patients had MTHFR deficiency; 7 (20%) patients had SLE; 4 (11%) patients had ITP; 4 (11%) patients VWF deficiency; while 1 (3%) patient had one of the following: polycythemia vera, platelet dysfunction, factor 7 deficiency, homocystinuria, prothrombin mutation, Noonan Syndrome, Activated C protein resistance & Shwachman disease. 86 patients had a coagulation profile done, of those 72 (84%) had risk mutations. 18% were males (n=13) & 82% were females (n=59). 26 (36%) patients had MTHFR C677T gene & 27 (38%) patients had MTHFR A1289T gene mutation with Intermediate risk. 4 (6%) patients had intermediate risk MTHFR gene mutation without specific mutation mentioned. 9 (13%) patients had MTHFR C677T mutation & 4 (6%) patients with MTHFR A1289T mutation with High risk. 25 (35%) patients had intermediate risk for platelet enzyme CYP2C19*17 activity & 11 (15%) patients with CYP2C19*2*3 activity. 5 (7%) had high risk for platelet enzyme CYP2C19*17 activity & 2 (3%) with CYP2C19*2*3 activity & 10 (14%) showed high risk for factor V Leiden mutation.

CONCLUSION

Coagulopathies are relatively common in POTS patients & should be investigated in proper clinical scenarios such as unexplained bruising & bleeding tendencies.

DROXIDOPA MANAGEMENT IN POTS

N. JOY*, E. ALGABRE, H. MISTRY, K. MUNEZ, M.A. NASRI, S. ALAM, R. JAJUNDA, K. KOMMERA, Z. REHMAN, A. SULEMAN

BACKGROUND

POTS is a condition characterized by tachycardia, dizziness, syncope, palpitations, chest discomfort and fatigue. Droxidopa is a synthetic amino acid prodrug used to increase norepinephrine levels in the peripheral nervous system, enabling the body to maintain blood flow during orthostasis. The purpose of this study is to evaluate the effect of Droxidopa on POTS patients.

METHODS

We performed a retrospective study on 638 patients diagnosed with POTS using Electronic Medical Recording system from October 2014 to June 2017. Inclusion criteria were POTS patients who had failed first-line therapies for POTS. Patients taking Droxidopa were then studied based on dosage, symptomatic response, and side effects.

RESULTS

Out of 14 patients on Droxidopa, all showed initial symptomatic improvement with dizziness, syncope, chest pain, shortness of breath as well as increase in energy on an average median dose of 200 mg BID. However, only 4 patients (28.6%) have sustained improvement of symptoms. From these, 3 patients (75%) are maintained at 400 mg TID and 1 patient (25%) at 200 mg TID. 10 of 14 patients (71.4%) discontinued Droxidopa, of which, 5 (50%) had rebound of POTS symptoms. Those with rebound symptoms were on the following dosages: 3 (60%) were on 400 mg TID, 1 (20%) was on 200 mg BID and the other 1 (20%) was on 100 mg OD. The remaining 5 (50%) had side effects: 2 (40%) who were titrated to 200 mg OD had an increase in blood pressure, 1 (20%) titrated to 400 mg OD had increased blood pressure and headaches, 1 (20%) titrated to 100 mg BID had headaches, and 1 patient (20%) titrated to 200 mg TID had joint pains and swelling.

CONCLUSION

Droxidopa may have a potential role in POTS. It should only be considered if all other management options are exhausted.

MEDIAN ARCUATE LIGAMENT SURGERY IN POTS: IS POST OPERATIVE CELIAC ARTERY VELOCITY (POCAV) A SUCCESS MARKER?

R.D. DADA*, M.A. NASRI, H. MISTRY, K. KOMMERA, N. JOY, K. MUNEZ, S. ALAM, E. ALGABRE, R. IQBAL, A. SULEMAN

INTRODUCTION

Median arcuate ligament syndrome (MALS) is a condition characterized by abdominal pain, nausea, and bloating after consumption of food as well as weight loss. Treatment for MALS includes surgical decompression of the celiac axis. The purpose of this study is to determine the relationship between celiac velocity during the expiration phase and patients POTS & MALS symptoms after surgery.

METHODS

We performed retrospective study on 22 patients (pts) that have undergone the MALS correction from June 2014 to March 2017. 15 of these pts have had a celiac velocity on expiration before and after surgery documented. The patients were divided into groups based on their celiac expiration velocity (cm/sec) following the surgery (<200, 200-300, 300-400, >400). The patients were also categorized based changes in their POTS & MALS symptoms following the surgery.

RESULTS

Out of 15 pts, 3 were males (age 20.67 + 4.73) & 12 were females (age 23.67 + 5.99). 6 patients had a POCAV <200 (5 pts symptoms improved, 83.3%), 5 patients had a POCAV 200-300 (2 pts symptoms improved, 40%), 3 patients had a POCAV 300-400 (1 pt symptoms improved, 33.3%), and 1 pt had a POCAV >400 (0 pts symptoms improved, 0%).

CONCLUSION

Our research demonstrated to us that there appears to be correlation between celiac artery velocity during the expiration phase and patients showing improvement in their POTS & MALS symptoms ($R^2=0.936$). As the velocity of the celiac artery expiration decreases, the percentage of patients showing improvements in their symptoms tends to increase.

EFFECTS OF IVABRADINE ON AUTONOMIC PARAMETERS IN POTS PATIENTS

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OBJECTIVE

The purpose of this study is to identify differences in autonomic parameters including Heart Rate with Deep Breathing, Expiration/Inspiration (E/I) ratio, and Valsalva ratio of POTS patients before and after starting Ivabradine.

INTRODUCTION

Ivabradine is a “funny” channel blocker used in clinical trials to treat POTS. It is a heart rate-lowering agent, acting by selective inhibition of the cardiac pacemaker If current that controls spontaneous diastolic depolarization in the sinus node. Our previous study showed >80% improvement of palpitations and tachycardia in POTS patients taking Ivabradine with a median dose of 2.5 mg once daily.

METHODS

A retrospective study on 638 POTS patients was conducted from June 2014 – March 2017. Inclusion criteria were patients taking Ivabradine who underwent autonomic testing before and after Ivabradine use. We collected parameters of Heart Rate with Deep Breathing (HRDB), E/I ratio, and Valsalva ratio before and after starting Ivabradine and compared the data through a two-tailed t-test using a double-blind method.

RESULTS

Our study showed that out of 57 patients taking Ivabradine, 14 patients underwent autonomic testing. The means for HRDB before and after using Ivabradine were 19.02 with SD of 9.05 and 15.04 with SD of 9.48, respectively. The p-value after 1 omission was 0.011. E/I ratio means before and after using Ivabradine were 1.237 with SD of 0.142 and 1.232 with SD of 0.215, respectively. The p-value after 3 omissions was 0.0345. The means for Valsalva ratio before and after using Ivabradine were 1.707 with SD of 0.372 and 1.516 with SD of 0.248, respectively. The p-value after 2 omissions was 0.019.

Omissions were applied after unmatched selection of certain outliers by the observers due to testing difficulties.

CONCLUSION

We have previously reported that Ivabradine benefits POTS patients. When using Ivabradine, physicians should be cognizant about its effect on the ANS.

AUTONOMIC PARAMETERS IN POTS PATIENTS BEFORE AND AFTER MEDIAN ARCUATE LIGAMENT SYNDROME SURGERY

S. ALAM*, K. KOMMERA, H. MISTRY, K. MUNEZ, E. ALGABRE, M.A. NASRI, N. JOY, R.D. DADA, A. SULEMAN

OBJECTIVE

The purpose of this research is to evaluate Autonomic Parameters before and after MALS surgery in POTS patients.

INTRODUCTION

Postural Orthostatic Tachycardia Syndrome (POTS) is characterized by an excessive increase in Heart Rate with postural changes. A previous study demonstrated that 15% of POTS patients were found to have Median Arcuate Ligament Syndrome (MALS), a condition characterized by abdominal pain attributed to compression of the Celiac Artery and Celiac Ganglia by the Median Arcuate Ligament. Patients who received MALS surgery according to our subsequent study exhibited 50% overall improvement of symptoms.

METHODS

A retrospective study was done utilizing 638 POTS patients from Electronic Medical Records from June 2014 – March 2017. 100 patients were found to have MALS from which 22 underwent elective MALS surgery. Eleven of the 22 patients with Autonomic Parameters consisting of Heart Rate with Deep Breathing (HRDB), Valsalva, and Stand Test were selected. Data collected before and after MALS surgery was interpreted using a double blind method and compared through a two-tailed T-test. Outliers in the test results were omitted due to testing difficulties.

RESULTS

There were 11 patients who had HRDB data. The mean before surgery was 21.986 ± 10.509 and the mean after surgery was 23.772 ± 8.990 (p-value = 0.119). There were 9 patients with Valsalva ratio data. The mean before surgery was 2.079 ± 0.407 and the mean after surgery was 1.818 ± 0.34 (p-value = 0.0468). Omitting 1 patient, 9 patients had Stand test data. The mean before surgery was 0.707 ± 0.099 and the mean after surgery was 0.78 ± 0.0726 (p-value = 0.081).

CONCLUSION

Our study demonstrates that there was mild improvement in Valsalva ratio after MALS surgery (p<0.05). There was a trend towards improvement with HRDB and Stand test. However, it did not achieve statistical significance.

POTS AND ITS ASSOCIATED CHRONIC PAIN SYMPTOMS

CHANDRALEKHA ASHANGARI, AMER SULEMAN. PROCEEDINGS OF AMERICAN HEART ASSOCIATION-BCVS 2015 CONFERENCE, NEW ORLEANS, LA, USA. CIRCULATION JOURNAL .ISSN 1524-4539 SEP/OCT ISSUE SUPPLEMENT

OBJECTIVE

The aim of this study is to determine the chronic pain symptoms in Postural Orthostatic tachycardia syndrome (POTS) patients .

BACKGROUND

The Postural Orthostatic Tachycardia Syndrome (POTS) affects primarily young women. POTS is a form of dysautonomia that is estimated to impact between 1,000,000 and 3,000,000 Americans, and millions more around the world. The symptoms of POTS are widespread because the autonomic nervous system plays an extensive role in regulating functions throughout the body.

METHODS

Two hundred fifty-five (255) POTS patients were randomly selected from our clinic (January 2014 to March 2015), reviewed the medical records of 255 POTS patients for chronic pain symptoms and performed data analysis .

RESULTS

Two hundred thirty-three of the 255 (91%) patients are females (n=233, age 29.20 ± 10.32), Twenty-three of the 255 (9%) patients are males (n=23, age 29.70 ± 14.52).63% (161 of the 255) had Joint Pain/aches, 51% (131 of the 255) had Chronic headache, 40% (102 of the 255) had chest pain, 31% (80 of the 255) had Migraine, 30% (76 of the 255) had Chronic back pain,16% (42 of the 255) had Heartburn,8%(20 of the 255) had Chronic pleurisy, Rheumatoid arthritis, Muscle aches, Chronic regional pain syndrome and hip aches .

CONCLUSION

Our study is the first to characterize that patients with postural orthostatic tachycardia syndrome (POTS) have a very high prevalence of chronic pain symptoms.

GASTROINTESTINAL DISTURBANCES IN POTS

CHANDRALEKHA ASHANGARI, AMER SULEMAN. PROCEEDINGS OF INTERNATIONAL ACADEMY OF CARDIOLOGY ANNUAL SCIENTIFIC SESSIONS, 20TH WORLD CONGRESS ON HEART DISEASE VANCOUVER, BC, CANADA . THE JOURNAL OF HEART DISEASE (CARDIOLOGY ONLINE) .ISSN:1556-7451,JULY 2015,VOLUME 12,NUMBER 1.

OBJECTIVE

The aim of this study is to determine the gastrointestinal disturbances in Postural Orthostatic Tachycardia Syndrome (POTS) patients.

BACKGROUND

The Postural Orthostatic Tachycardia Syndrome (POTS) affects primarily young women. POTS is a form of dysautonomia that is estimated to impact between 1,000,000 and 3,000,000 Americans, and millions more around the world. POTS is a form of orthostatic intolerance that is associated with many Gastro-intestinal disturbances.

METHODS

249 patients referred to our clinic from January to November with POTS. Reviewed the medical records of 249 POTS patients and gastrointestinal symptoms.

RESULTS

Out of 249 patients, 226 patients are female (90.76%; average age 32.69), 23 patients are male (9.24%; average age 27.91). Out of 249 patients 189 patients (76%) had vomiting or nausea, 150 patients (60%) had irritable bowel syndrome, 128 patients (51%) had bloating, 125 patients (50%) had constipation, 80 patients (32%) had abdominal pain, 56 patients (22%) had delayed gastric emptying, 24 patients (10%) had lactose intolerance, 8 patients (3%) had Gastroesophageal reflux disease, 5 patients (2%) had Iron deficiency anemia, 6 patients (2%) had Peptic ulcer disease, 4 patients (2%) had Celiac Disease.

CONCLUSION

Patients with POTS have a very high prevalence of gastrointestinal symptoms however the majority of abnormalities appear to be motility related. Motility testing should be performed in POTS patients. The diagnostic yield of endoscopic procedures appears to be low.

VITAMIN B12 DEFICIENCY IN POTS

CHANDRALEKHA ASHANGARI, AMER SULEMAN. PROCEEDINGS OF INTERNATIONAL ACADEMY OF CARDIOLOGY ANNUAL SCIENTIFIC SESSIONS, 20TH WORLD CONGRESS ON HEART DISEASE VANCOUVER, BC, CANADA . THE JOURNAL OF HEART DISEASE (CARDIOLOGY ONLINE) .ISSN:1556-7451,JULY 2015,VOLUME 12,NUMBER 1.

OBJECTIVE

The aim of this study is to investigate the association between vitamin B12 levels and Postural orthostatic tachycardia syndrome (POTS).

BACKGROUND

The Postural Orthostatic Tachycardia Syndrome (POTS) affects primarily young women. POTS is a form of dysautonomia that is estimated to impact between 1,000,000 and 3,000,000 Americans, and millions more around the world. We frequently find vitamin B12 deficiency in patients who present with POTS. Vitamin B12 is involved in the production of adrenaline from noradrenaline. It is the cofactor involved in catecholamine degradation.

METHODS

155 patients were selected randomly from our clinic with POTS. Patients Vitamin b12 levels charts were reviewed from electronic medical records, Vitamin b12 deficiency status was defined as a serum level <200 pg/mL.

RESULTS

Out of 155 patients, 146 patients are female (94%, n=146, age 33.68 ± 7.26), 9 patients are male (6% ,n=9 ,age 24.73 ± 4.39). 89(57%) patients had serum level <200 pg/mL, 66(43%) patients had serum level >200 pg/mL.

CONCLUSION

Our research results demonstrated that Postural Orthostatic Tachycardia Syndrome (POTS) patients have significantly lower vitamin B12 levels (57% have Vitamin B12 deficiency serum level <200 pg/mL).

VITAMIN D DEFICIENCY STUDY IN POTS

CHANDRALEKHA ASHANGARI , AMER SULEMAN. PROCEEDINGS OF AMERICAN HEART ASSOCIATION QUALITY OF CARE AND OUTCOMES RESEARCH 2015 MEETING BALTIMORE, MD USA .JOURNAL CIRCULATION: CARDIOVASCULAR QUALITY AND OUT-COMES. ISSN: 1941-7705, MAY 2015, VOLUME 8, ISSUE SUPPL 2; 8: A121.

OBJECTIVE

The aim of this study is to assess vitamin D levels, including the prevalence of vitamin D deficiency/insufficiency in Postural Orthostatic Tachycardia Syndrome (POTS) patients.

BACKGROUND

The Postural Orthostatic Tachycardia Syndrome (POTS) affects primarily young women. POTS is a form of dysautonomia that is estimated to impact between 1,000,000 and 3,000,000 Americans and millions more around the world. We frequently find vitamin D deficiency in patients who present with POTS.

METHODS

180 patients were selected randomly from our clinic with POTS. Patients Vitamin D levels charts were reviewed from electronic medical records, 25-OH vitamin D (Vitamin D3) status was defined as Normal (>30 ng/mL), Insufficient (20.0 - 29.9 ng/mL), and deficient (<20 ng/mL).

RESULTS

Out of 180 patients, 170 patients are female (94%, $n=170$, age 31.88 ± 10.36), 10 patients are male (6% ,age 25.83 ± 6.19). 79 patients had vitamin D3 level >30 ng/ml, 10 patients had vitamin D3 level range >20.0 to 29.9 ng/mL, 91 patients had vitamin D3 level < 20 ng/mL.

CONCLUSION

Our research results demonstrated that Postural Orthostatic Tachycardia Syndrome (POTS) patients have a higher rate of vitamin D3 deficiency (51% have Vitamin D3 less than 20 ng/mL). Vitamin D3 levels are low in more than half of POTS patients (56% had less than 30 ng/mL).

ENDOMETRIOSIS IN POTS

CHANDRALEKHA ASHANGARI, AMER SULEMAN. PROCEEDINGS OF ENDOMETRIOSIS FOUNDATION OF AMERICA 6TH ANNUAL CONFERENCE, 2015 NEW YORK, NY, USA.

OBJECTIVE

The aim of this study is to determine the endometriosis findings in Postural Orthostatic Tachycardia Syndrome patients.

BACKGROUND

The Postural Orthostatic Tachycardia Syndrome (POTS) affects primarily Young women. POTS is a form of dysautonomia that is estimated to impact between 1,000,000 and 3,000,000 Americans, and millions more around the world.

METHODS

Postural Orthostatic Tachycardia Syndrome patients were referred to Our clinic from January 2014 to January 2015. One Hundred and forty Six (146) female patients were Selected randomly. 146 female Postural Orthostatic Tachycardia Syndrome patients proceedings were reviewed comprehensively from Electronic Medical records and performed Data analysis (Patients age mean \pm standard deviation and percentage calculation).

RESULTS

Out of One Hundred and forty Six (146) female Postural Orthostatic Tachycardia Syndrome patients (n=146, age 33.68 ± 7.26), 48 patients (33%) had endometriosis.

CONCLUSION

Our research results demonstrated that One third of Postural Orthostatic Tachycardia Syndrome patients have Endometriosis, there may be a connection with Endometriosis in Postural Orthostatic Tachycardia Syndrome patients as a precipitant and perpetuating cause, although further studies should be done to define better.

EHLERS—DANLOS SYNDROME (EDS) AND ITS ASSOCIATED DERMATOLOGIC SYMPTOMS

CHANDRALEKHA ASHANGARI, AMER SULEMAN. PROCEEDINGS OF AMERICAN ACADEMY OF DERMATOLOGY 2015 SUMMER ACADEMY MEETING, NEW YORK, NY ,USA.

OBJECTIVE

The aim of this study is to determine the associated Dermatologic Symptoms in Ehlers- Danlos syndrome (EDS) patients.

BACKGROUND

Ehlers-Danlos syndrome (EDS) is a group of inherited disorders characterized by an increased elasticity of the skin, hyperextensibility of the joints, and increased fragility of the skin and blood vessels

METHODS

203 patients randomly referred to our clinic from January 2014 to December 2014 with EDS were included in the study, reviewed the medical records of 203 patients and dermatologic symptoms.

RESULTS

Out of 203 patients, 193 patients are female (95 %; n=193 age 30.88 ± 10.36), 5 are males (5% ;n=5; age 22.83 ± 8.19), Our findings are as follows 101 patients (50%) had loose skin, Fragile skin, Poor wound healing, Bruising, 33 patients(16%) had Discoloration of legs and arms and multiple concussions, 30 patients (15%) had Eczema, Fungemia, Keratosis pilaris, Dark skin pigmentation, 15 patients(7%) had Folliculitis, Lu-pus, Nevus, 15 patients (7%) had Skin Rash, Nevus ,Rosacea, Sjogren syndrome, 5 Patients(2%) had Translu-cent skin, 2 Patients (1 %) had Skin cancer.

CONCLUSION

Our study indicates that patients in Ehlers–Danlos syndrome (EDS) has strong association with Dermatologic Symptoms (92% EDS patients has Dermatologic Symptoms).

BALANCE DISORDERS IN POTS

CHANDRALEKHA ASHANGARI, AMER SULEMAN, SADAF SYED. PROCEEDINGS OF INTERNATIONAL SOCIETY FOR AUTONOMIC NEUROSCIENCE (ISAN) 2015 ANNUAL CONFERENCE IN CONJUNCTION WITH FEDERATION OF EUROPEAN AUTONOMIC SOCIETIES (EFAS), AMERICAN AUTONOMIC SOCIETY (AAS), JAPAN SOCIETY OF NEUROVEGETATIVE RESEARCH (JSNR), STRESA, ITALY. THE JOURNAL OF AUTONOMIC NEUROSCIENCE :BASIC AND CLINICAL. ISSN : 1566-0702.

OBJECTIVE

The purpose of this research is to test the Balance disorders in POTS patients through Balance testing.

BACKGROUND

Postural Orthostatic Tachycardia Syndrome (POTS) is a form of dysautonomia that is estimated to impact between 1,000,000 and 3,000,000 Americans, and millions more around the world. POTS is a form of orthostatic intolerance that is associated with the presence of excessive tachycardia and many other symptoms like Headache, Abdominal discomfort, Dizziness/ presyncope, Balance disorder, Nausea, Fatigue, Lightheadedness, Sweating, Sleep disorder, Tremor, Anxiety, Palpitations, Exercise intolerance upon standing.

METHODS

80 POTS patients were randomly selected from our clinic with dizziness, lightheadedness, pre-syncope, balance disorders and performed clinical test of sensory integration in all the patients. The testing done in four conditions with eyes open on firm surface, eyes closed on firm surface, eyes open on foam surface and eyes closed on foam surface. Sway index is calculated in all four conditions. Sway index with eyes open on firm surface <0.50 is considered better, >0.50 is worse. eyes closed on firm surface <1 is considered better, >1 is worse. eyes open on foam surface <0.75 is considered better, >0.75 is worse. eyes closed on foam surface <2.25 is considered better, >2.25 is worse.

RESULTS

Out of 80 POTS patients, 98% are females ($n=78$, age 28.08 ± 9.09), 2% are males ($n=2$, age 31.62 ± 11.62). Balance testing with eyes open 0.98 ± 0.71 (Worse in $n=61$, 76%); eyes closed 1.62 ± 1.47 (Worse in $n=53$, 66%); eyes open on foam surface 1.47 ± 1.04 (Worse in $n=75$, 94%); eyes closed on foam surface 3.38 ± 1.49 (Worse in $n=59$, 74%).

CONCLUSION

Our research study demonstrated that POTS patients have significant balance disorders with worse sway index in all four conditions in higher percentage of patients.

FREQUENCY OF SYMPTOMS IN POTS

ARMANIOUS HEIDI HENRY, ABDELMASSIH HANY SAMY, CHANDRALEKHA ASHANGARI, AMER SULEMAN. PROCEEDINGS OF INTERNATIONAL SOCIETY FOR AUTONOMIC NEUROSCIENCE (ISAN) 2015 ANNUAL CONFERENCE IN CONJUNCTION WITH FEDERATION OF EUROPEAN AUTONOMIC SOCIETIES (EFAS), AMERICAN AUTONOMIC SOCIETY (AAS), JAPAN SOCIETY OF NEUROVEGETATIVE RESEARCH (JSNR), STRESA, ITALY. THE JOURNAL OF AUTONOMIC NEUROSCIENCE: BASIC AND CLINICAL. ISSN: 1566-0702.

OBJECTIVE

The aim of this study is to determine the symptoms frequency in Postural Orthostatic Tachycardia Syndrome (POTS) patients.

BACKGROUND

Postural orthostatic tachycardia syndrome (POTS) is a type of dysautonomia seen most commonly in young women. In addition to typical autonomic symptoms, POTS patients report a wide range of subjective complaints in multiple organ systems, though the exact frequencies are unclear.

METHODS

An intake form consisting of a list of 53 symptoms with frequencies was handed over to the patients at our clinic, defined as follows: 0 as Never, 1 as 1 time a month, 2 as 2-4 times a month, 3 as 5-7 times a month, 4 as 20-25 times a month, 5 as Daily. 155 POTS patients participated in the research study. Analysis was performed on data obtained.

RESULTS

Out of 155 POTS patients, 94% are females (n=145, age 29.89 ± 12.21), 6% are males (n=10, age 32.16 ± 16.32). 99% of POTS patients experienced 1 or more symptoms (average number of symptoms 32.56 ± 11.21 SD). 97% of POTS patients reported 52 symptoms with frequency 5, 94% reported 52 symptoms with frequency 4, 89% reported 47 symptoms with frequency 3, 87% reported 41 symptoms with frequency 2. Most common symptoms reported are Fatigue, Dizziness, Muscle aches, Neck/shoulder aches, Rapid heartbeat, Difficulty falling asleep, Headache, Joint aches, Anxiety, Lightheadedness on standing, Blurring of vision, Impaired memory, Bloating after meals, Nausea/Vomiting, Trouble tolerating heat, SOB, Confusion, Blurring on standing, Head or room spinning, Lightheadedness, Tremulousness, Eyes sensitive to light, Feeling of weakness, Trouble tolerating cold, Difficulty staying asleep, Chest discomfort, Constipation, Excessive daytime sleepiness, Impaired memory on standing, Frequent waking during night, Heartburn.

CONCLUSION

First time, our research demonstrated that people with POTS experience an average of 32 symptoms. Majority of patients live through POTS symptoms daily.

A COMPREHENSIVE STUDY ON POTS SYMPTOMS

CHANDRALEKHA ASHANGARI, AMER SULEMAN. PROCEEDINGS OF INTERNATIONAL SOCIETY FOR AUTONOMIC NEUROSCIENCE (ISAN) 2015 ANNUAL CONFERENCE IN CONJUNCTION WITH FEDERATION OF EUROPEAN AUTONOMIC SOCIETIES (EFAS), AMERICAN AUTONOMIC SOCIETY (AAS), JAPAN SOCIETY OF NEUROVEGETATIVE RESEARCH (JSNR), STRESA, ITALY. THE JOURNAL OF AUTONOMIC NEUROSCIENCE :BASIC AND CLINICAL. ISSN : 1566-0702
OBJECTIVES : THE AIM OF THIS STUDY IS TO DETERMINE THE SYMPTOMS IN POSTURAL ORTHOSTATIC TACHYCARDIA SYNDROME (POTS) PATIENTS.

BACKGROUND

The Postural Orthostatic Tachycardia Syndrome (POTS) affects primarily young women. Postural Orthostatic Tachycardia is a syndrome as such, there is a collection of symptoms that distinguish it.

METHODS

The Autonomic Nervous system Questionnaire consisted of Fifty-Three POTS symptoms hand over to the Patients at our clinic, 318 POTS patients were participated in the comprehensive research study.

RESULTS

Out of 316 POTS patients, 304 patients are female (96%, age 32.75 ± 12.14), 12 patients are male (4%, $n=12$, age 31.56 ± 14.83). Our findings are as follows 308(97%) had headache, 304(96%) had dizziness, 302(96%) had fatigue, 300(95%) had anxiety, nausea and vomiting, 294(93%) had heartburn, 292(92%) had constipation, 282(89%) had fainting/syncope and confusion, 272(86%) had tremulousness, 260(82%) had neck/shoulder aches, blurring of vision and joint aches, 256(81%) had muscle aches, 254(80%) had chest discomfort, bloating after meals, difficulty to fall asleep, and loose or watery stools, 250(79%) had rapid heartbeat, 246(78%) had itching of the feet, 244(77%) had clamminess of skin, forceful slow heartbeat and itching of the hands, 238(75%) had difficulty emptying bladder, 232(73%) had impaired memory and urinary incontinence or leaking, 228(72%) had head or room spinning, 200(63%) had SOB, 150(47%) had saliva dribbling, Food stuck in throat and Trouble tolerating heat, 146(46%) had Blurring on standing, Difficulty swallowing/Choking, Eyes sensitive to light, Trouble tolerating cold, Difficulty staying asleep, Excessive sweating during day, Excessive sweating during night and Lightheadedness on standing, 138(44%) had Impaired memory on standing, 110(35%) had Lightheadedness, 104(33%) had Excessive sweating, 102(32%) had Feeling of weakness, 90(28%) had Frequent wakening during night, 86(27%) had Excessive daytime sleepiness, 82(26%) had Difficulty with starting to urinate, 58(18%) had Abdominal discomfort, Daytime fatigue, Exertional SOB, Leg cramps, Pain in legs, and SOB while lying down, 18(6%) had Impotence.

CONCLUSION

POTS is heterogeneous disorder that disturbs normal autonomic control associated with wide variety of symptoms

GASTRIC EMPTYING IN POTS

CHANDRALEKHA ASHANGARI, AMER SULEMAN. PROCEEDINGS OF HEART RHYTHM CONGRESS ANNUAL CONFERENCE.

OBJECTIVE

The aim of the study is to determine the first 30 minutes of gastric emptying in POTS patients.

BACKGROUND

Postural Orthostatic Tachycardia Syndrome (POTS) is a form of dysautonomia that is estimated to impact between 1,000,000 and 3,000,000 Americans, and millions more around the world. POTS is a form of orthostatic intolerance that is associated with the presence of excessive tachycardia and many other symptoms upon standing. Patients with POTS have a very high prevalence of gastrointestinal symptoms like vomiting or nausea, irritable bowel syndrome, bloating, constipation, abdominal pain, lactose intolerance, Gastroesophageal reflux disease, Peptic ulcer disease, Celiac Disease, however the majority of abnormalities appear to be motility related.

METHODS

142 patients with POTS who had gastrointestinal symptoms were selected for the study. Patients underwent Gastric emptying study by nuclear medicine technician and physician using radioactive chemicals that measures the speed with which food empties from the stomach and enters the small intestine. Patient will eat a solid component of the meal, a liquid component of the meal or both are mixed with a small amount of radioactive material. A Scanner is placed over the patient's stomach to monitor the amount of radioactivity in the stomach for a few hours after the test meal is eaten.

RESULTS

Out of 142 patients, 89% are females, (n=127, Age 31.81 ± 13.51), 11% are males (n=15, Age 27.75 ± 15.94). First 30 minutes of gastric emptying in 142 patients (mean \pm standard deviation) $30.09\% \pm 28.95\%$, 111 patients (78%) had $<50\%$ gastric emptying, 31 patients (22%) had $>50\%$ gastric emptying.

CONCLUSION

First time in large cohort of patients, our research study demonstrated that higher percentage (78%) of POTS Patients had delayed abnormal gastric emptying in the first 30 minutes of gastric emptying study.

SWALLOWING SYNCOPE: A CASE REPORT IN LIGHT OF LITERATURE

ARMANIOUS HEIDI HENRY, ABDELMASSIH HANY SAMY, CHANDRALEKHA ASHANGARI, AMER SULEMAN. PROCEEDINGS OF SOUTHERN MEDICAL ASSOCIATION 2015 ANNUAL CONFERENCE, DESTIN, FL, USA . SMA PULSE. 2015, OCT; 3(10): P-5.

BACKGROUND

Swallowing syncope is a rare type of neurocardiogenic syncope which leads to cerebral hypoperfusion due to a vagal reflex. This can lead to various types of bradyarrhythmias as well as a temporary reduction of cardiac output. To date, there are only a few cases recorded. In most of these cases, there was an underlying abnormality in the esophageal or cardiac conduction system with intermittent heart block.

CASE

A 50-year-old female was referred to the clinic with a history of recurrent episodes of lightheadedness associated with swallowing and upon standing. She reported having two episodes of fainting. The first episode occurred after lunch. The second occurred after drinking a carbonated soda. Her vitals were: BP: 121/85 mmHg, HR: 82 bpm, oxygen saturation: 98%, RR: 14 bpm. Cardiovascular examinations showed no abnormality. The following tests were done: • Carotid Doppler: evidence of carotid atherosclerosis. • Tilt table test: abnormal, within 8 minutes, HR increased from 65 to 82. PCO₂ dropped from 43 to 28 mmHg. BP dropped from 97/74 to 50/29 consistent with neurocardiogenic syncope.* • Autonomic testing and CMP: unremarkable • Stress test: non-diagnostic T-wave changes. • Holter monitor: 2 episodes of 2nd degree AV block. *However, the clinical history did not support neurocardiogenic syncope. Although tilt was positive but since there was a discordance in history and clinical finding we decided to proceed with further work up.

RESULTS

275 POTS Patients were randomly selected from our Clinic and underwent CPX. The CPX involves exercising on a treadmill or stationary cycle while closely monitored and breathing through a mouthpiece and/or face mask. A cardiopulmonary stress test was performed in accordance with ACC/AHA guidelines (Class I) to assist in the differentiation of cardiac versus pulmonary limitations as a cause of impaired exercise capacity or exercise induced dyspnea. A Sensor Medix Vmax metabolic cart was used. The patient exercised on cycle ergometer using a 20 watts/min ramp protocol. Heart rate was measured using a Marquette(Max-1) 12-lead ECG system. VO₂(ml/ kg/ min)%, VO₂(l/min)%, VCO₂(l/min), Work (watts%), Anaerobic threshold(AT)(l/min), Heart rate%, O₂ pulse(ml/ beat)% VE Max (l/min) BTPS% Respiratory rate(RR), Breathing reserve%, Respiratory quotient, SpO₂ was calculated.

FINAL DIAGNOSIS

An injectable loop recorder (ILR) was inserted that recorded an episode of third degree AV block lasting more than 3 seconds. She had other AV block episodes. A permanent dual chamber pacemaker was implanted.

OUTCOME

In patients with swallowing syncope, intermittent complete heart block has been reported in several isolated case reports. Therefore, a definitive diagnosis of a cardiac rhythm disturbance must be established and thus strict rhythm monitoring should be done and the use of ILR should be considered. We suggest implantation on loop recorder as a very viable choice.

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