AUTONOMIC FUNCTION, ANXIETY AND MITRAL VALVE PROLAPSE

Nagwa Eid SobhY

Internal Medicine, Faculty of Medicine, Cairo University

ABSTRACT

This study included 20 patients with mitral valve prolapse (10 symptomatic and 10 asymptomatic). They were compared with 10 patients with anxiety and 10 normal subjects.

All individuals were subjected to autonomic function tests, anxiety score and two dimensional echocardiogram. There were significant difference in heart rate response to deep breathing between normal subjects and other groups. While no significant difference in Valsalva was noted between the different groups.

There were significant changes in diastolic blood pressure response to sustained hand grip between normal subjects and other groups. While there was no significant change in systolic or diastolic pressure on standing between different groups.

Patients with mitral valve prolapse (symptomatic and asymptomatic) had significant higher anxiety score than that ot normal subjects and significant lower score than those with anxiety. Symptomatic patients with MVP has no significant difference as compared to patients with anxiety, while asymptomaic patients had lower score.

We noticed that autonomic dysfunction are present in patients with MVP regardless of the presence or absence of symptoms, as well as in patients with anxiety.

INTRODUCTION AND AIM OF THE WORK

There is much controversy in the medical literature as to the cause of symptomatology in mitral valve prolapse syndrome. Some scientists believe that autonomic dysfunction are factors which appropriately explain symptoms (Barrett et al., 1991).

While others found autonomic imbalance in patients with MVP

irrespective of symptomatology (Drory et al., 1989) or of age (Kawano et al., 1989).

The aim of this work is to study the interrelationship between mitral valve prolapse, autonomic dysfunction and anxiety.

MATERIAL AND METHODS

The study is carried on 40 middle aged individuals (10 symptomatic and 10

asymptomatic patients with MVP, 10 patients with anxiety and 10 normal

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controls). Conditions that may affect autonomic system like that of age, thyrotoxicosis, diabetes, β blockers, were excluded from the study.

All participants were subjected to thorough clinical history, physical examination, routine investigations, blood sugar, thyroid function test and ECG.

Two dimensional echocardiography was done for every case using Hewellet Packard Model CAG 7040 machine by staff echocardiography. The mitral valve was examined in the parasternal and apical imaging planes. According to echocardiographic findings, MVP was classified as mild, moderate or sever.

Psychological state was assessed using Tailer's Anxiety scale (Tailer, 1953). Score from 0: < 16 is considered normal.

Sympathetic function were assessed using blood pressure response to standing and to sustained hand grip (Ewing, 1978). Parasympathetic function were assessed using heart rate response to Valsalva manoeuver (Levin, 1986) and R-R interval during breathing (Ewing et al., 1981).

RESULTS

Results are represented in tables 1-12 & Figures 1-3.

| Table (1): | Mean | value of | clinical | and | laboratory | findings | in | patients | with | MVP |
|------------|--------|----------|----------|-----|------------|----------|----|----------|------|-----|
| | (group | 1). | | | | | | | | |

| Variable | Mea | ın±S.D. | Range |
|--|---|---|---|
| Age S. supine D. supine S. stand D. stand S. hand D. hand Valsalva Breath A. score Echo Fasting | 26.00 124.00 82.50 125.50 86.25 131.50 90.50 11.24 9.60 18.60 1.65 81.80 | 9.39 12.94 10.58 15.30 9.72 12.99 8.26 0.23 6.67 8.43 0.67 11.73 | 15-42 $105-160$ $70-110$ $105-160$ $70-100$ $110-160$ $75-100$ $9-108$ $2-29$ $5-36$ $1-3$ $67-105$ |
| рр | 133.10 | 6.17 | 120 - 145 |

| Variable | Mean±S.D. | | Range |
|-----------|-----------|-------|---|
| Age | 23.00 | 6.45 | 15.00 - 33.0 $110.00 - 160.0$ $75.00 - 110.0$ $110.00 - 160.0$ $70.00 - 100.0$ $120.00 - 160.0$ $80.00 - 100.0$ $1.05 - 1.6$ $2.00 - 29.0$ $9.00 - 36.0$ $1.00 - 3.0$ |
| S. supine | 129.50 | 13.43 | |
| D. supine | 87.50 | 11.12 | |
| S. stand | 128.00 | 15.49 | |
| D. stand | 87.00 | 10.33 | |
| S. hand | 135.50 | 12.12 | |
| D. hand | 91.00 | 7.74 | |
| Valsalva | 1.19 | 0.19 | |
| Breath | 9.60 | 6.67 | |
| A. score | 18.60 | 8.43 | |
| Echo | 1.65 | 0.67 | |
| Fasting | 81.80 | 11.73 | 68.00 - 97.0 |
| pp | 133.10 | 6.17 | 122.00 - 141.0 |

 Table (2): Mean value.of clinical and laboratory findings in patients with asymptomatic MVP (group IA).

 Table (3): Mean value of clinical and laboratory findings in patients with symptomatic MVP (group IB).

| Variable | Mean±S.D. | | Range 1-I |
|--|---|---|--|
| Age S. supine D. supine S. stand D. stand S. hand D. hand Valsalva Breath A. score Echo Easting | 23.60 118.50 77.50 123.00 85.50 127.50 90.00 1.29 10.10 16.00 1.60 81.90 | 11.37 10.28 7.54 15.49 9.55 13.17 9.12 0.26 5.82 8.00 0.51 13.96 | 15.0 - 42.0 $105.0 - 135.0$ $70.0 - 90.0$ $105.0 - 150.0$ $70.0 - 100.0$ $110.0 - 150.0$ $75.0 - 100.0$ $0.9 - 1.8$ $5.0 - 24.0$ $5.0 - 30.0$ $1.0 - 2.0$ $67.0 - 105.0$ |
| pp | 134.20 | 6.82 | 120.0 - 145.0 |

| Variable | Mear | ±S.D. | Range 1-I |
|-----------|--------|-------|---------------|
| Age | 34.80 | 8.23 | 20.0 - 45.0 |
| S. supine | 129.50 | 11.65 | 110.0 - 150.0 |
| D. supine | 84.50 | 12.34 | 70.0 - 110.0 |
| S. stand | 120.00 | 15.63 | 90.0 - 150.0 |
| D. stand | 81.50 | 12.92 | 70.0 - 100.0 |
| S. hand | 130.00 | 15.63 | 90.0 - 150.0 |
| D. hand | 89.50 | 14.23 | 70.0 - 120.0 |
| Valsalva | 1.31 | 0.27 | 0.9 - 1.8 |
| Breath | 10.40 | 8.04 | 3.0 - 25.0 |
| A. score | 24.80 | 11.48 | 4.0 - 46.0 |
| Fasting | 76.20 | 8.97 | 63.0 - 90.0 |
| РР | 134.70 | 6.43 | 123.0 - 144.0 |

 Table (4): Mean value of clinical and laboratory findings in patients with anxiety (group II).

Table (5):Mean value of clinical and laboratory findings in normal subjects (group
III).

| Variable | Mean±S.D. | | Range 1-I |
|-----------|-----------|-------|---------------|
| Age | 33.90 | 8.49 | 24.0 - 45.0 |
| S. supine | 114.50 | 11.65 | 110.0 - 130.0 |
| D. supine | 73.50 | 8.18 | 60.0 - 80.0 |
| S. stand | 108.50 | 13.13 | 90.0 - 130.0 |
| D. stand | 68.00 | 11.10 | 50.0 - 80.0 |
| S. hand | 118.00 | 12.29 | 100.0 - 135.0 |
| D. hand | 92.00 | 10.32 | 70.0 - 105.0 |
| Valsalva | 1.25 | 0.12 | 1.1 - 1.5 |
| Breath | 16.70 | 1.94 | 13.0 - 19.0 |
| A. score | 9.60 | 2.91 | 5.0 - 14.0 |
| Fasting | 77.80 | 12.07 | 62.0 - 99.0 |
| рр | 129.70 | 4.11 | 124.0 - 137.0 |

| | Group IA -1.5±7.5 | Group IB +4.5±9.6 | Group II -9.5±15.7 | Group III -6±5.2 |
|-----------------------|----------------------|----------------------|-----------------------|---------------------|
| Group IA -1.5±7.5 | | | | |
| Group IB +4.5±9.6 | 0.07 | | | |
| Group II -9.5±15.7 | 0.08 | *< 0.01 | | |
| Group III -6±5.2 | 0.07 | *< 0.003 | 0.25 | |

 Table (6):
 Comparing effect of standing on systolic blood pressure among different groups.

* Signif. < 0.05

 Table (7): Comparing effect of standing on diastolic blood pressure among different investigated groups.

| | Group IA -0.5±12.1 | Group IB +8±7.1 | Group II -3±15.5 | Group III -5.5±4.3 |
|-----------------------|-----------------------|--------------------|---------------------|-----------------------|
| Group IA -0.5±12.1 | | | | |
| Group IB +8±7.1 | *< 0.03 | | | |
| Group II -3±15.5 | 0.34 | *< 0.03 | | |
| Group III -5.5±4.3 | 0.12 | *< 0.0013 | 0.31 | |

| | Group IA +6±5.7 | Group IB +9±6.6 | Group II +0.5±15.7 | Group III +3.5±4.7 |
|-----------------------|--------------------|--------------------|-----------------------|-----------------------|
| Group IA +6±5.7 | | | | |
| Group IB +9±6.6 | 0.14 | | | |
| Group II -0.5±15.7 | 0.16 | 0.07 | | |
| Group III +3.5±4.7 | 0.15 | 0.07 | 0.29 | |

 Table (8): Comparing effect of hand grip on systolic blood pressure among different investigated groups.

| Table (9): | Comparing effect of hand grip on diastolic blood pressure among different |
|------------|---|
| | investigated groups. |

| | Group IA +3.5±7.5 | Group IB +12.5±4.9 | Group II +5±9.4 | Group III +18.5±7.1 |
|------------------------|----------------------|-----------------------|--------------------|------------------------|
| Group IA +3.5±7.5 | | | | |
| Group IB +12.5±4.9 | *< 0.003 | | | |
| Group II +5±9.4 | 0.35 | *< 0.02 | | · |
| Group III +18.5±7.1 | *< 0.001 | *< 0.02 | *< 0.0001 | |

| | Group IA 1.19±0.19 | Group IB 1.29±2.69 | Group II 1.31±0.27 | Group III 1.25±0.12 |
|------------------------|-----------------------|-----------------------|-----------------------|------------------------|
| Group IA 1.19±0.19 | | | | |
| Group IB 1.29±2.69 | 0.17 | | | |
| Group II 1.31±0.27 | 0.13 | 0.42 | | 997 1 7 4 - 1 |
| Group III 1.25±0.12 | 0.21 | 0.33 | 0.25 | |

Table (10): Comparin effect of Valsalva on R-R interval among the different investigated groups.

Table (11): Comparing effect of deep breathing on R-R interval among the different investigated groups.

| | Group IA +9.1±7.7 | Group IB +10.1±5.8 | Group II 10.4±8 | Group III +16.7±2 |
|----------------------|----------------------|-----------------------|--------------------|----------------------|
| Group IA 9.1±7.7 | | | | |
| Group IB 10.1±5.8 | 0.37 | | | |
| Group II 10.4±8 | 0.35 | 0.46 | | |
| Group III 16.7±2 | *< 0.003 | *< 0.002 | *< 0.001 | |

| | Group IA +21.2±8.4 | Group IB +16±8 | Group II 24.8±11.5 | Group III 9.6±2.9 |
|-----------------------|-----------------------|-------------------|-----------------------|----------------------|
| Group IA 21.2±8.4 | | | | |
| Group IB 16±8 | 0.9 | | | |
| Group II 24.8±11.5 | 0.22 | *< 0.03 | | |
| Group III 9.6±2.9 | *< 0.003 | *< 0.01 | < 0.0004 | |

Table (12): Comparing anxiety score among the different investigated groups.

Fig. (1) : Comparing effect of standing on systolic and diastolic BLPr among different investigated groups.







Fig. (3) : Comparing Valsava, deep breathing and anxiety score among the different investigated groups.



DISCUSSION

Mitral valve prolapse (MVP) is a common disorder. It is estimated to be present in 4-15 % of the general population (Barrett et al., 1991). The majority of patients with MVP remain asymptomatic, but a spectrum of symptoms can be encountered. Symptoms include palpitations, fatigue, chest pain, orthostatic changes and psychological aberrations (Wyngaarden, 1992).

In our study patients with MVP were 15 females and 5 males (3: 1). This finding agrees with that of Wgngaarden et al. (1992), who mentioned that MVP occurs most frequently in femals.

The symptomatic patients were 7 females and 3 males while the asymptomatic patients were 8 females and 2 males. Bondonlas and Wooley (1988) noticed that females presented more with symptoms than did males. This observation could be related to increased incidence of MVP in females.

We could not find any significant correlation between degree of MVP, assessed by echo, and presence or absence of symptoms. This finding agrees with that of Wyngaarden et al. (1992).

We found significant high anxiety score in patients with MVP than normal subjects (18.6 \pm 9.4 vs 9.6 \pm 2.9) and a significant lower score than patients with anxiety (24 \pm 11.5). There was no significant difference between patients with symptomatic MVP and patients with anxiety (21.2 \pm 9.4 vs 24.8 \pm 11.5) while a significant difference was noted between asymptomatic patients and those with anxiety (16 \pm 8 vs 24.8 \pm 11.5) Holmberg, (1987) mentioned that MVP is over presented in panic disorder. Also, American Psyctriatric Association (1987) noticed that MVP is an associated condition but does not preclude a diagnosis of panic disorder.

Chesler et al. (1985) suggested that MVP and symptomatology which is adrenergically mediated and precipitated by anxiety, represent a coincidence of two common conditions encountered in medical practice.

On the other hand, Smith et al. (1989) could not find any evidence of neurosis in symptomatic children with MVP.

In our study, there was no significant differences in Valsalva ratio among different groups. While there was significant difference in respons of heart rate to breathing between normal subjects and either patients with MVP or anxiety. In the same test, there were no significant differences between patients with MVP (as a whole or among those with and without symptoms) and patients with anxiety.

These findings agreed with that of Gallo-Junior et al. (1989) who found parasympathetic abnormalities in MVP patients. Barrett et al. (1991) thought that vagal responsiveness is one of the factors which explain the symptomatology of MVP patients.

In our study, although we found mild parasympathetic dysfunction in our patients with MVP, these abnormalities can not explain the pathogenesis of symptomatology as it occurs to the same extent in both symptomatic as asymptomatic patients with MVP as well as in patients with anxiety.

Although our patients with MVP (symptomatic or asymptomatic) showed no significant postura changes in blood pressure but they failed to increase their diastolic blood pressure to significant level especially in symptomatic MVP and patients with anxiety.

These findings agree with that of Drory et al. (1989) and Barrett et al. (1991), they found sympathetic dysfunction in patients with MVP. Our findings disagree with that of Taylor et al. (1989) who observed that the hemodynamic responses to autonomic stimuli in asymptomatic MVP patients are indistinguishable from those observed in normal subjects. Also, we disagree with Chesler et al. (1985) and Smith et al. (1989) who did not find any evidence of autonomic dysfunction in symptomatic patients with MVP.

In our study, we found that patients with MVP has evidence of neurosis and both sympathetic and parasympathetic dysfunction. These autonomic dysfunctions are present in both symptomatic and asymptomatic MVP as well as in patients with anxiety.

So, we can consider MVP, autonomic dysfunction and neurosis as three components of one syndrome. Asymptomatic patients with MVP lie at one end of its spectrum and symptomatic patients lie at the other end.

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إضطرابات الجهاز العصبى اللا إرادى والتوتر العصبى وإرتباطه بسقوط الصمام الهيترالى

> نجوى عيد صبحى قسم الباطنة - كلية الطب - جامعة القاهرة

اشتملت الدراسة على عشرين حالة يعانون من سقوط وريقات الصمام الميترالى نصفهم يعانى من أعراض المرض ونصفهم لا يعانى من أى أعراض ، وقد تم مقارنة هؤلاء المرضى بعشرة من مرضى التوتر العصبى وعشرة أشخاص أصحاء .

وقد تم عمل اختبارات للجهاز العصبى اللا إرادى كما تم عمل تقييم للحالة النفسية طبقا لاختبار تيلور كما تم عمل فحص بالموجات فوق الصوتية ذات البعدين لجميع الحالات .

وقد لوحظ أن هناك ارتفاع ملحوظ فى معدل القلق لجميع مرضى سقوط وريقات الصمام الميترالى بالمقارنة بالأشخاص الأصحاء ولكن هذا الارتفاع كان أقل من مثيله فى مرضى التوبر العصبى ، وكذلك كان معدل القلق أعلى فى مرضى سقوط وريقات الصمام الميترالى الذين يعانون من الأعراض عن هؤلاء الذين لا يعانون من أى أعراض .

لم تثبت أى دلالة إخصائية بين المجموعات المختلفة فى الفالزلفا بينما كان هناك دلالة إحصائية فى تغييرات ضربات القلب مع الشهيق العميق بين مجموعة الأصحاء والمجموعات الأخرى وهذا ما يدل على وجود إضطرابات الجهاز العصبى الباراسمبثاوى .

وعند دراستنا للجهاز العصبى السمبثاوى لم تظهر قيمة إحصائية فى إنخفاض ضىغط الدم الإنقباضى والإنبساطى عند الوقوف بين المجموعات المختلفة لكن كان هناك تغيير ملحوظ ذو قيمة إحصائية في ضغط الدم الإنبساطي بعد قبضة اليد المستمرة بين مجموعة الأشخاص الأصحاء والمجموعات الأخرى حيث أن مرضى سقوط وريقات الصمام الميترالي الذين يعانون من أعراض كان التغير أقل من الذين لا يعانون من الأعراض ومجموعة الأصحاء .

بعد هذه الدراسة الإحصائية اتضبح أن مرضى سقوط وريقات الصمام الميترالى كانوا يعانون من ارتفاع معدلات القلق ومن اضطرابات الجهاز العصبى اللا إرادى ، وأن اضطرابات الجهاز العصبى اللا إرادى ليس لها علاقة بوجود أو عدم وجود أعراض فى مرضى سقوط وريقات الصمام الميترالى .

ذلك يجعلنا نعتبر أن سقوط وريقات الصمام الميترالى والتوبّر العصبى واضطرابات الجهاز العصبى اللا إرادى ثلاث مكونات متلازمة ، وعدم وجود أعراض فى مرضى سقوط وريقات الصمام الميترالى يمثل أول هذه المتلازمة ووجود أعراض يمثل الجهة الأخرى منها .