

MYOGLOBINURIA, HEMOGLOBINURIA AND BLOOD PRESSURE CHANGES IN TURKISH FOLK DANCERS

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Turkish folk dancers have won many international competitions i.e. first place in 1986 at Dijon, France; gold hatched in 1986 at Zakupane Poland. Turkish folk dance has almost the same characteristics as other sports. Some of the figures in the dances is characteristics as other sports. Some of the figures in the dances is characterised by sudden movements of the feet to the ground. Rhabdomyolysis has been defined in skiers, football players, and in clay drum players according to previous reports.

During the 1991 Turkish folk dance competition, the effects of physical activity and extremity contacts on arterial blood pressure and urinary system were investigated in 119 dancers whom 82 of them were female.

There was no apparent difference between systolic, diastolic and mean arterial pressure levels before and after the competition ($p > 0.05$). Urinary erythrocyte and acid pH values were significantly higher than those values at the beginning of the dance. Hemoglobinuria was found in only one female dancer. Granular casts were also detected in the latter dancer.

It can be suggested that, hemoglobinuria, myoglobinuria, and microscopic hematuria can be controlled by some precautions. Therefore, the effects of climate, altitude, water-electrolyte needs and toilet education were discussed for healthy dancing.

INTRODUCTION

Bar, kaşık, halay, horon, karşılama and bengi etc. are the kinds of Turkish folk dances. Horon and halay are relatively the most active types of the dance among these kinds. One important property, governs all kinds of Turkish folk dances, that is the repeatative strong strike of foot to the floor. Such activity requires high energy. During the early stage, ATP is provided from a reservoir by an aerobic pathway and then glykogenolysis and glikoneogenesis provide high energy (1,2). Breath rate rises and blood flows through hyperactive muscle tissue at this period.

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The blood flow of only the coroner vessels and brain remains at the same percentage (1,3,4,5,6,7,) catecholamine discharge occurs early and marked by stress factors.

As in non-contact sports such as body-building shying, long distance athletism and also as in Kongo, clay-durum, football players may show haemoglobinuria, and myoglobinuria too (8,9,10,12). Electrolyte imbalance occurs due to disintegrity in muscle cells, and intracellular substance moves towards circulating blood (8,9,10,11,12,13,14,15).

The consequence of these processes is likely to appear in the development of elevation of blood pressure, various bradiarrhythmias, ectopic beats, elevation in BUN and uric acid values, hematuria, myoglobinuria, crystalluria, oliguria, volume loss, tubulo-interstitial nephritis, and acute renal failure (1,16,17,18,19).

The purpose of this research is to present the affect of Turkish folk dance on the dancers' urinary systems and blood pressure and to provide the best conditions for dancing.

MATERIAL AND METHOD

Turkish folk dance competition is held annually in Gaziantep, Turkey.

The average temperature of Gaziantep in the month of march when the annual championship is held is about 20 degrees Celsius. Gaziantep is 800 meters above sea level and weather is known to be dry.

Selection of data

119 dancers were chosen for this research among groups arriving from the mediterranean, South anatolian and East Anatolian regions. There were 82 females with age range of 13-16 years, and 37 males with age range of 14-19 years (Table 1).

Table 1: Age ranges of dancers in this study

| Sex | Person | min. | max. | mean - + SD |
|-----|--------|------|------|-------------|
| M | 37 | 14 | 19 | 16 ± 3 |
| F | 82 | 13 | 16 | 14 ± 2 |

The selected persons for the research were asked about their medical history i.e. genetic neuromuscular defect, durg abuse, alcohol intake, infectious disease, cystitis, blood disease, menses and IM injection in last dans etc.

The dancers practiced their dances for a period of 3-4 hours daily, about 3 months prior to the competition.

Before and after the competition the dancers blood pressure was taken from their

right arm. Also urinary samples taken before and after the competition. Blood samples were not taken due to it being illegal to do so during the championship.

Doctors and biochemists examined urinary samples immediately after being taken five cc of filtered urine samples were mixed with 2.3 gr of ammonium sulphate and heated in order to detect myoglobine and haemoglobine in urine. Then 5 N NaOH was dropped in to obtain pH 8. After that the sample was centrifuged and reacted with urostick. Then washed with eau distillé and read after 30 seconds from scale. Positive reading were considered to indicate the existence of myoglobine. Myoglobine aggregates resulting from such positive result were tested using urostick after being saturated by sulphates, then analysed whether the positivity of this aggregates is related to myoglobine or haemoglobine (1,10,17).

Statistics

The results of tests taken before and after the dance were studied by the student T test $p > 0.05$ was taken as free degree of test. All of P values were checked twice.

RESULTS

Blood pressure of dancers was tested before and after the competition 119 person (82 F. 37 M).

Mean systolic blood pressure was before competition 126 ± 6 mmHg and after competition was 138 ± 8 mmHg; mean diastolic blood pressure before the competition was 72 ± 6 mmHg and 80 ± 6 mmHg after the competition; mean arteriel pressure (MAP) before the competition was 90 ± 5 mmHg and 94 ± 5 mmHg after the competition. These three parameters were considered to be statistically unimportant ($p > 0.05$) (Table 2).

Before the competition 40 urine samples (27 F, 13 M) were taken. After the competition 67 samples (42 F, 25 M) were taken. Before and after the competition glucose, sperm, amorphous phosphate were negative in urine samples. In one male and one female dancers after the competition trace protein was positive and in the same female dancer before and after the competition large count leucocyte detected.

Erythrocyte, CaOx percentage, and acid reaction that was found in urine after the competition was considered to be statistically important when compared with the results of the samples taken before the competition $p < 0.05$, (Table 3).

Hemoglobinuria was found in one female dancer and slight myoglobinuria was found in another female dancer after the competition. Granular cast was observed to exist in the same urine samples that were found to contain myoglobine. This observation was found in the tests applied on the team arriving competition. Granular cast was observed to exist in the same urine samples that were found to contain myoglobine. This observation was found in the tests applied on the team arriving from Diyarbakır (Table 4)

Table II: Blood pressure values in dancers of Turkish Folk Dance Competitions

| Varietes | | n | Min | Max | Mean \pm SD | P |
|----------------------|----|-----|-----|-----|---------------|---------|
| Systolic BP mmHg | BC | 119 | 90 | 160 | 126 \pm 6 | p>0.05 |
| | AC | 119 | 100 | 160 | 132 \pm 8 | |
| Diastolic BP mmHg | BC | 119 | 60 | 100 | 72 \pm 6 | p>0.05 |
| | AC | 119 | 60 | 100 | 80 \pm 4 | |
| MAP | BC | 119 | 82 | 136 | 88 \pm 4 | p>0.005 |
| | AC | 119 | 86 | 140 | 89 \pm 5 | |

n: Case number BC: Before competition AC: After competition SD: Blood pressure

Table III: Urine results in Turkish Folk Dance Competition

| | | Before Competition | After Competition | P |
|------------------|-------|-----------------------|----------------------|--------|
| Urinary protein | + | 40 | 38 | >0.05 |
| | Trace | — | 2 | >0.05 |
| | — | — | — | |
| Urinary glucose | — | — | — | |
| Leucocyt | L | 39 | 39 | >0.05 |
| | XL | 1 | 1 | 0.05 |
| Ertrocyte | E | 6 | 20 | <0.05* |
| | XE | — | — | |
| Epithelial cell | H | 30 | 33 | >0.05 |
| | XE | 6 | 7 | >0.05 |
| Acit reaction | | 8 | 40 | <0.05* |
| Granuler cast | | — | 1 | >0.05 |
| Amorph phosphate | — | — | — | |
| Ca oxalete | | 7 | 30 | <0.05 |
| Sperm | | — | — | |
| Urate | 4 | 11 | 0.05 | >0.05 |

L: Acceptable conunt of leucocyte
E: Acceptable count of erythrocyte
H: Acceptable Count of epitelial cell

XL:Large amount of leucocyte
XE: Large omount of erythrocyte
*: p 0.05 statistically significant

**Table IV:
Hemoglobinuria and myoglobinuria in dancers
of Turkish Folk Dance Competitions**

| | Reaction | Before Competetion | After Competetion | P |
|--------------------------------|----------|-----------------------|----------------------|--------|
| Free Hemoglobin in Urine | — | 40 | 39 | > 0.05 |
| | + | — | 1 | |
| | +++ | — | — | |
| | +++ | — | — | |
| Myoglobin in urine | — | 40 | 39 | > 0.05 |
| | + | — | 1 | |
| | ++ | — | — | |
| | +++ | — | — | |

DISCUSSION

Myoglobine was observed to exist in persons who practice light degree of body building and general training (20,21). In this research myoglobine was not observed in the urine of the tested dancers excet in only one case. Granular casts were also detected in the same dancer. Myoglobine might be detected in the tested urine samples only when its rate was exceeded 100 mg/dl according to previous reports (11,22).

The urine tests were not very sensitive regarding to the existence of another myoglobinuria which froms due to muscle degradation.

It was expected not to be able to detect the myoglobine in urine samples because it exbrates within a very short time (1-2 hrs). However, in the tests done in this research myoglobin was detected.

Urinary bladder has an essential role in the forming of haematuria (23,24). Before dancing, empty bladder was compressed by another neighboring anatomical organs and especially hard ones such as prostat gland, caused contusion on bladder and thus may lead to haematuria from bladder wall and epithelial surface (23,24).

Due to the elaborate traditional costumes worm by Turkish folk dancers is ti not easy to get dressed and undressed quickly; therefore, the dancers do not have bladder emtying habits.

Haematuria was observed in light degree in the tests. However, this was not unexpected and does not contradict with what was fond in the literature survey (1,7,23).

Two cases observed minimal hemoglobinuria which may be related with the erectil position of dancing and ritmic extremity traumas. In erectil position of walking or running strength exercises exist with hemoglobinuria. Furthermore in sitting or Liéing sports or exercises do not show hemoglobinuria. That results shows that related only traumatic hemolysis in foot by Davidson (23,24).

In exercised and trained persons blood pressure under the acute and tired exercise showing slow vessels response (20,25). There was no significant changing in systolic diastolic and MAP values.

Changes in three parameters in dancers which had physically prepared for a long time for competition was as expected.

There was positive correlation between rectal heat, sweating in the dancing and body weight and this result shows that it is important that sufficient fluid be taken before the competition to protect the bladder and body fluid loss (26,27). At the beginning an intake of 300 cc volume is advised. Coke and sweet beverages may rise acidity in tubules and may delay gastric emptying (13,16,23,28).

In our study as a result

- Climate adaptation of dancers (18,22,23,28)
- Acid containing beverages must leave place to basic and low sugar containing beverages (23)
- Emptying colon before dancing but will leave a little amount of urine in bladder. This study was supported by the Milliyet newspaper and Folk Dance Organizer Uzman Sağlık.

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