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Effect of weight gain on Balance Control in Post-menopausal Women

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Abstract:

Background: This research was designed to determine the effect of weight gain on balance control in post-menopausal women. Fifty postmenopausal women were selected from Gamal Abdelnaser hospital for medical insurance in Alexandria, Egypt. Their age ranged from 50 to 64 years old. **Groups:** They were divided into two groups. Group A, 25 subjects with normal body weight, body mass index (BMI <25 kg/m2) and group B, 25 obese subjects (BMI > 30 kg/m2). Balance measured by Biodex Balance System (measuring dynamic balance parameter; overall (OA), anterior-posterior (AP) and medial-lateral (ML) stability index scores.

Results: this study showed that The scores of overall, anterior-posterior and medial-lateral in group B were significantly higher than group A with P value <.05.

The study demonstrated that post-menopausal weight gained women had weak balance control compared to normal weight group. **Conclusion:** we conclude that balance control in weight gained post-menopausal women has deteriorated more than normal weight women.

Key words: balance, obesity, balance, post menopause.

1.Introduction

Postmenopausal women are more likely to be overweight and obese as a result of hormonal alternate, joining nearly 1.5 billion obese adults worldwide. Furthermore, 2.8 million people worldwide die each year as a result of obesity-related diseases (1).

General health condition is affected by obesity in different age stages, as elevated occurrence of persistent illness as DM, cardiac problems, musculoskeletal deficits and defacement of psychological issues which affect the standard of life (2).

Life time is a very strong detect of weight in women. The highest value of the mean of weight gain is observed in the old age more than 55 years. In this age gaining weight is almost nine times more prevalent than in the sixteenth age group (3).

Getting older is unique element. In reality, many researches have appeared that weight gain rises with age, with menopausal women getting an about 1.1 pound per year (4).

Balance loss is a great threat for falling. Progressive physiological alterations in numerous subsystems involved in maintaining postural balance, for example the neuro musculoskeletal system, might result in poorer postural balance. Furthermore, from a psychological standpoint, a lack of confidence in keeping balance throughout daily tasks may have an effect on the quality of postural control (5). The obese tend to have higher levels of functional limitation than the non-obese (6).

Increased BMI appears to cause postural flairty in both men and women of the same age, although it appears to have a greater influence on females of the same age (7).

In normal physical movement the stability is foremost component, keep erect status and in tangled venture needed for scheming abilities. if core of body is not adequately felt within the base area. It will be very hard to keep erect status (8).

The dynamic components of human movement are affected by an increase in body weight, and as well influence the status, swap the figure of anthropoid two-footed motion (anthropoid walking shape) (9,10).

Some researchers find the effect of weight gain on balance in neurological cases otherwise there were fewer researches on post-menopausal women. The goal of this study was to find the influence of weight gain on balance control in post-menopausal women.

2.Materials and Methods

2.1. Participants

Across section, non-experimental study was conducted. A full of 70 postmenopausal women were recruited. Participants from Gamal Abdelnaser hospital for medical insurance in Alexandria, Egypt, out of which 50 were enlisted for this research (Fig. 1).

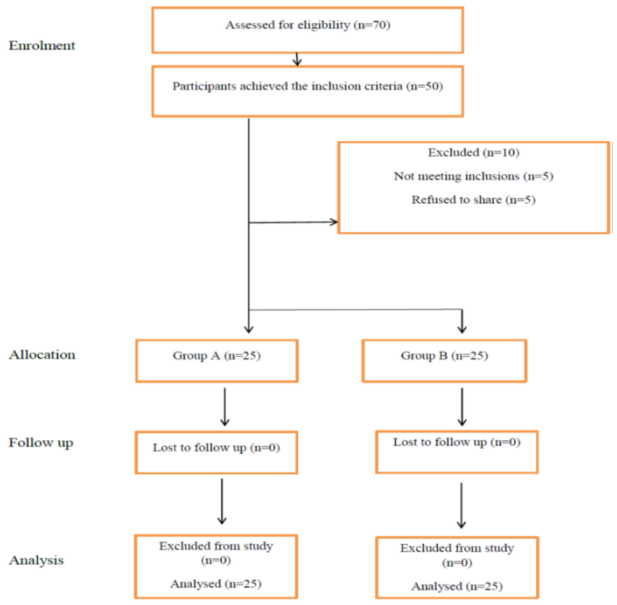

Fig. (1): Flow chart of the participants during the trial

Clients life span differ from 50 to 64 years.

Goal of the research was to investigate the efficacy of weight gain on balance control in post-menopausal women.

The study was conducted for three months from 1 September 2021 to 30 November 2021.

In this study there were two groups divided as follow; control group (A): participants with (BMI) fall behind 25 kilograms per meter square and study group (B): participants (BMI) > 30 kilograms per meter square. Any neuromuscular or musculoskeletal defects were excluded from the study.

On the report of Hills & Parker (11), BMI between 18.5-25 is regarded typical, between 25-30 is regarded as gross weight, and BMI 30 and beyond was deemed obesity. The subject's BMI was estimated by multiplying her weight beyond the quad of her height in metric units: BMI was measured in kilogrammes per square metre.

2.2. Procedures

All women attended one evaluation time and were directed about the under way evaluation previous to details addition. Balance was tested by Biodex Balance System: that is stability showing and teaching method, it involved mobile balance platform, that allocated within 25º of plan lean in 360º scale. The movement in frontal plan, movement in the coronal plan and in all directions. All indices are dynamic balancing metrics tested with steadiness levels (stability levels) obtainable in ordered range from very hard plan (level of stability-12) to unsteady plan (level of stability-6) [12]

Proprioceptive arrangement was operated in erect status by biodex system.

Every woman wasn't wearing any footwear and was ordered to look on the monitor directly ahead and try to sustain the pointer in the middle of monitor during erect within unsteady plan (level of stability-7) for 25 seconds.

2.3. Outcome measurement

Movable stability indices: in frontal plan (AP), in coronal plan (ML) and in all directions (OA) were wrote down for data examination.

Statistical analysis

Statistical analysis was established by un-paired t test to estimate the level of significance of stability test between normal weight and weight gained women.

P<0.05 was the level of significance used. BMI was matched up with stability examination.

3.Results

Table 1 shows the participants' basic characteristics. Although at that point no difference that is statistically significant in age between normal weight group and weight gained group (p>0.05), there was a difference that is statistically significant in BMI (p<0.0001).

Table 1 Subjects' demographic characteristics

Items	Group A Mean ± Standard deviation	Group B Mean ± Standard deviation	P value
Age	53.48 ± 2.63	53.68 ± 3.08	0.8060
BMI	23.63 ± 0.81	34.56 ± 2.74	< 0.0001

[NS] P > 0.05 = non-significant, P = Probability.

As appear in Table 2, the stability indices mean values for both groups measured at stability level seven. There was a difference that is statistically significant between control group A and study group B P<0.05 in OA, AP and ML stability indices.

Table 2. Stability indices for the group A versus weight gained women group B at stability level seven

Items	Group A Mean ± Standard deviation	Group B Mean ± Standard deviation	P value
Overall stability index	2.112 ± 0.695	4.264 ± 0.649	0.0001 >
Anteroposterior stability index	1.64 ± 0.468	3.76 ± 0.436	0.0001 >
Medio lateral stability index	1.54 ± 0.498	4.4 ± 0.577	0.0001 >

Data were expressed as mean ± standard deviation.
[NS] P > 0.05 = non-significant, [S] P < 0.05 = significant, P = Probability.

4.Discussion

. In our research study we demonstrated that balance control was decreased in weight gained women less than in normal weight women. which founded by alterations in stability indices mean values which detected by biodex balance system at stability level seven.

The results of this study equaled with **Hue O et al.,** who suggested that body weight may be an important risk factor for falling. Also **Greve J et al.,** proved that high BMI demands more displacements to maintain postural balance. (13,14)

The result of current study agreedwith **Menegoni F, et al.,** The increased body mass seems to produce AP instability in both genders(15).

Data of this study corroborated those of **Handrigan GA, et al.** who claimed that obese people are less stable than healthy-weight people, and that decreased stability impairs upper-limb movement performance. Without weight loss, neither an active lifestyle involving a regular physical activity programme nor increased strength appear to be effective in reducing the deleterious consequences of excess weight on balance control (16).

Other studies have found that utilising the biodex balance system is used to evaluate postural balance in healthy people who has a high level of reliability. Prior research has proven that the device is reliable. it was discovered that the apparatus was a valid evaluation device in normal college students (N = 20) throughout many test trials (20 seconds) (17,18).

According to the findings of this study findings, I approved that weight gain had deleterious effect on balance Control in post-menopausal Women.

5.Conclusion

It can be concluded that post-menopausal women with a higher BMI have poorer balance control than whom weight was normal.

Conflict of Interests

The authors state no conflict of interest or any financial interest or benefit from this research.

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Abbreviations

BMI- body mass index**, OA-** overall**, AP** anterior-posterior**, ML-** medial-lateral**, BBS**-biodex balance system**, DM**-diabetes mellitus**.**

Conflict of Interests

The authors declare no conflict of interest.

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