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Evaluation of Static and Dynamic Balance During Menstrual Cycle (Day 1 And Day 14) And Its Correlation with Primary Dysmenorrhea in Physiotherapy Students (18-25 Year) - A Correlational Study

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ABSTRACT

The purpose of study was to evaluate static and dynamic balance during menstrual cycle (Day 1 and Day 14) and its co relation with primary dysmenorrhea in physiotherapy study (18-25 year). [Subject and Methods] 45 subjects (mean age 21.75 year) weight 21.57kg; height 154.5cm) participated in the study. The balance assessment was done for static balance, single leg stance test (rt and lt leg) and dynamic balance using star excursion balance test (rt and lt leg)..[Results] The study was done, the study showed that there was an impairment in balance and significant increase in postural sway at day 14 compared to day 1 [p <0.05].The moderate negative correlation exist between dynamic balance (rt) and (lt) day 14 WaLIDD Score, (primary dysmenorrhea). This implies that as WaLIDD score increases the dynamic balance i.e. STAR EXCURSION BALANCE TEST score decreases on day 14.[Conclusion] The study concludes that balance is affected at 14th day of menstrual cycle as compared to 1 st day. There is moderate negative correlation exist between primary dysmenorrhea and dynamic balance.

Keywords: [Menstrual cycle, static balance, dynamic balance, WaLIDD score balance impairment]

INTRODUCTION

The reproductive system of a female, shows regular cyclic changes that tele-logically may be regarded as periodic preparation for pregnancy and fertilization. In primates and humans, the cycle is a menstrual cycle, and its most conspicuous feature is the periodic vaginal bleeding that occurs with the shedding of uterine mucosa (menstruation).[1] The length of the cycle is notoriously variable, but an average figure is 28 days from the start of one menstrual period to the start of next. By common usage, the days of the cycle are identified by number starting with the first days of menstruation. It begins at puberty, ranging from the ages of 10 to 16, and ends at menopause at an average age of 51.

The first phase of the menstrual cycle is the follicular or proliferative phase. It occurs from day zero to day 14 of the menstrual cycle, based on the average duration of28 days. The variability in length of the menstrual cycle occurs due to variations in the length of the follicular phase. The main hormone during this phase is estrogen, specifically 17-beta-estradiol. The increase in this hormone occurs by the upregulation of the FSH receptors within the follicle at the beginning of the cycle. However, as the follicular phase progresses to the end, the increased amounts of 17-beta-estradiol will

provide negative feedback to the anterior pituitary. The purpose of this phase is to grow the endometrial layer of the uterus. 17-beta-estradiol achieves this by increasing the growth of the endometrial layer of the uterus, stimulating increased amounts of stroma and glands, and increasing the depth of the arteries that supply the endometrium, the spiral arteries.

Ovulation always occurs 14 days before menses; therefore, with an average 28- day cycle, ovulation occurs on day

At the end of the proliferative phase, 17-beta-estradiol levels are at a high due to the follicle maturation and increased production of the hormone. During this time only, 17-beta-estradiol provides positive feedback for FSH and LH production. The high levels of FSH and LH present during this time is called the LH surge. As a result, the mature follicle breaks, and an oocyte is released. The changes to the cervix as initiated during the follicular phase further increase, allowing for increased, waterier cervical mucous to better accommodate the possible sperm the levels of 17-beta-estradiol fall at the end of ovulation.

The next phase of the menstrual cycle is the luteal or secretory phase. This phase always occurs from day 14 to day 28 of the cycle. Progesterone stimulated by LH is the dominant hormone during this phase to prepare the corpus luteum and the endometrium for possible fertilized ovum implantation. As the luteal phase ends, progesterone will provide negative feedback to the anterior pituitary to decrease FSH and LH levels and, subsequently, the 17-beta-estradiol and progesterone levels. The corpus luteum is a structure formed in the ovary at the site of the mature follicle rupture to produce 17-beta-estradiol and progesterone, which is predominant at the end of the phase due to the negative feedback system. This is achieved by the progesterone stimulating the endometrium to slow down endometrial proliferation, decrease lining thickness, develop more complex glands, accumulate energy sources in the form of glycogen.

Balance refers to an individual's ability to maintain their line of gravity within their base of support (BOS)[2]. It can also be described as the ability to maintain equilibrium, where equilibrium can be defined as any condition in which all acting forces are cancelled by each other resulting in a stable balanced system. Static Balance is the ability to maintain the body in some fixed posture. Static balance is the ability to maintain postural stability and orientation with center of mass over the base of support and body at rest. Dynamic Balance is dynamic postural stability is more challenging, Dynamic balance is the ability to transfer the vertical projection of the center of gravity aroundthe supporting base of support. Dynamic balance is the ability to maintain postural stability and orientation with center of mass over the base of support while the body parts are in motion.

The mechanisms involved in static balance were best summarized by Bannister et. al. He noted that normal standing required: Sufficient power in the muscles of the lower limbs and trunk to maintain the body erect. Normal postural sensibility to convey information concerning position. Normal impulses from the vestibular labyrinth concerning position. A central coordinating mechanism, the chief part of which is the vermis of the cerebellum. The activity of higher centers concerned in the willed maintenance of posture. With these mechanisms the dynamic balance requirements can be inferred as: Sufficient power in the muscles of the body to maintain movement and stability. Normal postural sensibility to convey information regarding movement. Normal impulses from the vestibular system and visual system concerning movement and environment. Central coordinating mechanism including cerebellum and basal ganglia. The activity of higher centers concerned in the willed/ involuntary maintenance of movement and stability.

Dysmenorrhea is defined as pain associated with menstruation of sufficient magnitude so as to affect day- to- day activities. The term

dysmenorrhea comes from Greek word for difficulty monthly flow. Dysmenorrhea is classifiedinto two: Primary dysmenorrhea is defined as painful menstruation experienced by women with normal pelvic anatomy and Secondary dysmenorrhea is defined as who have pelvic pathology like endometriosis etc. The prevalence for primary dysmenorrhea as high as 90 percent and also affects the quality of life. In primary dysmenorrhea pain is spasmodic in nature and pain felt in suprapubic area [lower abdomen], it may radiate to lower back and thighs. The onset is usually 6 to 12 months after menarche with regular ovulatory cycle.

Estrogen secretion naturally varies in young women, increasing 10- to 100-fold over the menstrual cycle. Estrogen receptors are present in all musculoskeletal tissues including muscle (Barros and Gustafsson, 2011; Luo and Kim, 2016), bone (Cui et al., 2013), ligament(Liu et al., 1996), and tendon (Bridgeman et al., 2010). To attempt to explain the increased ACL rupture in the pre-ovulatory phases, researchers have measured knee laxity throughout the cycle. In men and women with no history of knee injury, the men showed no statistical difference in knee laxity over time; however, in women laxity increased from 4.7 ± 0.8 mm in the follicular phase, to 5.3 ± 0.7 mm in the ovulatory phase (Deie et al., 2002). These authors concluded that knee laxity is dependent on female hormones (Deie et al., 2002). Similarly, Shultz et al. (2005) found that knee laxity increased in direct relation to elevations in plasma estradiol levels. The variations in laxity were found to be cyclic in nature. When estrogen concentration increased during the menstrual cycle, knee laxity increased as well (Shultz et al., 2010, 2011, 2012).

In fact, these authors found that knee laxity increased between 1 and 5 mm between the first day of menstruation and the day following ovulation, depending on estrogen levels. Therefore, the present study is conducted to evaluate any disturbances in static & dynamic balance. single leg stance is used to assess the static postural and balance control. Balance assessment [like SLS test] are a valuable clinical tool for monitoring neurological and musculoskeletal status as well as for managing fall risk[3].

Star excursion test balance test is a dynamic test that requires strength, flexibility, and proprioception [4]. It is a measure of dynamic balance that provides a significant challenge to participant and physically active individual.

MATERIALS & METHODS

STUDY DESIGN: A cross sectional study.
STUDY TYPE: A correlational study
STUDY SETTING: DR. ULHAS PATIL COLLEGE OF PHYSIOTHERAPY, JALGAON
DURATION OF STUDY: 6 MONTHS
TARGET POPULATION: –
Physiotherapy students between 18 to 25 years of age withregular menstrual cycle.

INCLUSION CRITERIA:
Subjects who are willing to participate.
Young healthy females between 18 to 25 years of age.

EXCLUSION CRITERIA:
Any neurological disease that affects balance. (e.g.-poliomyelitis)
Any recent history of trauma of lower limb, spine, anklesprain, fracture.
Any history of musculoskeletal disease.
Limb length discrepancy.
Taking medications or pills that could affect the sex hormone
Subjects with irregular menstruation
Any pathology of pelvic floor.
PCOD.
Obese individual.

MATERIALS
Paper
Pen.
Chalk/floor sticky marker/athletic tape
Patient evaluation sheet.
Informed consent form.

OUTCOME MEASURE

Single leg stance test to assess static balance.
Star excursion test to assess dynamic balance.
WaLIDD Score questionnaire for primary dysmenorrhea.

RESEARCH DESIGN & METHODOLOGY

Sample size: - 45.
Sampling technique: - purposive sampling technique.
Minimum sample size(n)
Minimum sample size(n)
To estimate difference between M1 and M2

$$N = \frac{2\,Z^2 1S^2}{D^2}$$

Where, $m_1=3.18$ $s_1=0.87$
$m_2=4.18$ $s_2=1.84$
s=pooled SD=1.43 d=absolute precision=0.5
$Z_1=1.64$ at $\alpha=5\%$ level of significance
$Z_2=1.28$ at 90% power of test

$$N = \frac{2(1.64)^2(1.43)^2}{(0.5)^2}$$

N=45(minimum sample size

Statistical Tool

Paired T test for comparison of static & dynamic balance between beginning of menstruation & ovulation phase. Pearson correlation co-efficient test for static and dynamicbalance with WaLIDD Score.

PROCEDURE

Ethical clearance was obtained from the institutional ethical committee. The physiotherapy students were purposively selected as subjects. The purpose& procedure of the study was explained to subjects. Subjects screened according to inclusion & exclusion criteria. A written consent was obtained from selected part subjects. The selected subjects were evaluated for their last menstrual period. After that rough menstrual and gynecological history related to inclusion and exclusion criteria was noted. After that their WaLIDD Score was evaluated. The students were evaluated for static balance (single leg stance) and for dynamic balance star excursion balance on day1 and day14.

Static and dynamic balance.

For static and dynamic balance single leg stance balance and star excursion balance test was used.

Single leg stanceProcedure
Performed with eyes open and hands on the hips.

Participant must stand unassisted on one leg, timed from the time the other foot leaves the ground till when the foot touches the ground again or the arms leave the hips. If unable to stand for 5 seconds or less client at greater risk of injury from fall.

Dynamic balance test.

star excursion balance test

Procedure
Warm-ups should correspond to the biomechanical and physiological nature of the test. In addition, sufficient recovery (e.g., 3-5 minutes) was be administered following the warm-up and prior to the commencement of the test
The one should be wearing lightweight clothing and remove their footwear. After doing so,they are the required to stand in the center of the star and await further instruction.
When using the right foot as the reaching foot, and the left leg to balance, the subject should complete the circuit in a clockwise fashion.

Single leg stance(left) single leg stance (rt)

When balancing on the right leg, the one should perform the circuit in an anti-clockwise fashion.

With their hands firmly placed on their hips, the one should then be instructed to reach with one foot as far as possible and lightly touch the line before returning back to the starting upright position.

With a pencil, will mark the spot at which the athlete touched the line with their toe. This can then be measured from the center spot after the test to calculate the reach distance of each reach direction.

Reach distances should be recorded to the nearest 0.5cm. They should then repeat this with the same foot for all reach directions before changing foot. After they had completed a full circuit (every reach direction) with each foot, they should then repeat this process for a total of three times per leg. For example, they had three anterior reach performances for both their right and left leg. Once the athlete had performed 3 successful reaches with each foot in all directions, they were then permitted to step away from the testing area.

Was record the reach distance of each successful attempt, with a pencil, inorder to calculate the SEBT score after the test.

A working ability, location, intensity, days of pain, dysmenorrhea (WaLIDD) score was designed to diagnose dysmenorrhea and to predict medical level. The WaLIDD instrument was within an anonymous questionnaire that included all the variables evaluated in this research; in addition, it included information regarding age, menarche, characteristics of the menstrual cycle, type and number of nonsurgical treatments used to manage dysmenorrhea, number of days of medical leave due to dysmenorrhea 3 months prior to the survey, and the items "pain and drug score" contained in the VRS instrument.

Formula – average distance in each direction(cm)= reach 1+ reach 2+ reach 3÷ 3

Evaluation of dysmenorrhea using WaLIDD Score

Working ability	Location	Intensity (Wong–Baker)	Days of pain
0: None	0: None	0: Does not hurt	0: 0
1: Almost never	1: 1 site	1: Hurts a little bit	1: 1–2
2: Almost always	2: 2–3 sites	2: Hurts a little more – hurts even more	2: 3–4
3: Always	3: 4 sites	3: Hurts a whole lot – hurts worst	3: ≥5

Notes: Score: 0 without dysmenorrhea, 1–4 mild dysmenorrhea, 5–7 moderate dysmenorrhea, 8–12 severe dysmenorrhea. Wong–Baker scale was reclassified to adjust a four-level scale.
Abbreviation: WaLIDD, working ability, location, intensity, days of pain, dysmenorrhea.

RESULT

Total 45 subjects were included in this study.

Out of 45 ,16 was primary dysmenorrhic and 29 were normal subjects.

The study showed that there was an impairment in balance at day 14as compared to day 1 [p <0.05].

Moderate negative correlation exists between dynamic balance (rt) and (lt) day 14 WaLIDD

Score, (primary dysmenorrhea). This implies that as WaLIDD score (Primary dysmenorrhea)
increases the dynamic balance. i.e., STAR EXCURSION BALANCE TEST (Dynamic balance) score decreases on day 14.

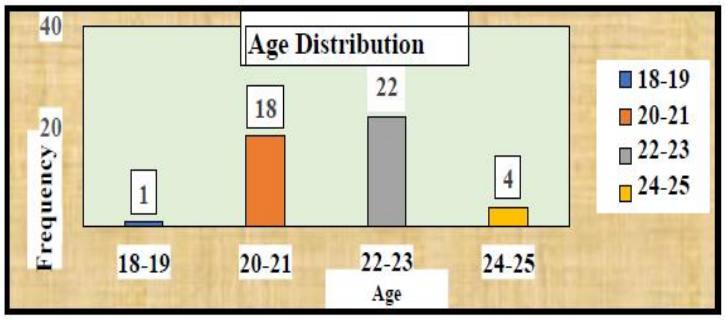
STATISTI CAL ANALYSIS

Statistical analysis: Statistical analysis was done using Graph pad instant. paired t-test is used for to compare the outcome measures, where the day 1 and day 14 data is compared respectively. Statistical significance was set at $p \leq 0.05$.

TABLE 1) AGE FREQUENCY DISTRIBUTION.

Age in years	frequency	percentage
18-19	1	2.22%
20-21	18	40.00%
22-23	22	48.89%
24-25	4	8.89%

Age	Mean	SD	Min	Max
	21.75	1.26	19	25



Graph no 1) AGE FREQUENCY DISTRIBUTION COMMENT-

In study group, 1 subject was between 18-19 years of age ,18 subjects were
between 20-21 yearsof age,22 subjects were between 22-23 years of age,4 subjects were between 24-25 years of age, Mean is 21.75, SD is 1.26.

Table no 2) BODY MASS INDEX

Variable	Groups	Frequency	Percentage
BMI	Underweight	6	13.33
	Normal	34	75.56
	Overweight	5	11.11
	Obese	0	0.00

BMI	Mean	SD	Min	Max
	21.57	2.74	15.2	27.8

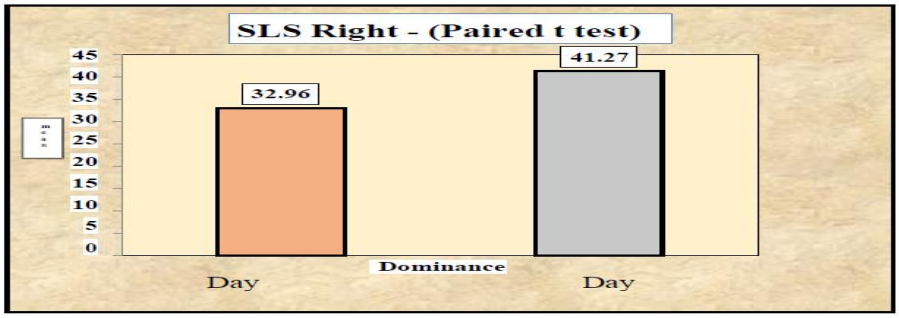
GRAPH [2] BMI DISTRIBUTION COMMENTS-

In our study 6 (13.33%) subjects were underweight, 43 (75.56 %) subjects were normal weight 5(11.11 %) subjects were overweight & there was no single subject with obesity
BMI Mean was 21.57 & SD was 2.75.

TABLE NO 3) EVALUATION OF STATIC BALANCE OF RIGHT LEG ON DAY 1 & DAY14OF MENSTRUAL CYCLE USING SINGLE LEG STANCE.

COMMENT- Graph no 3(evaluation of static balance on 1st day)

Variable	Groups	N	Mean	SD	t value	p value
SLS Right	Day 1	45	41.27	20.47	7.00	0.000
	Day 14	45	32.96	17.82		

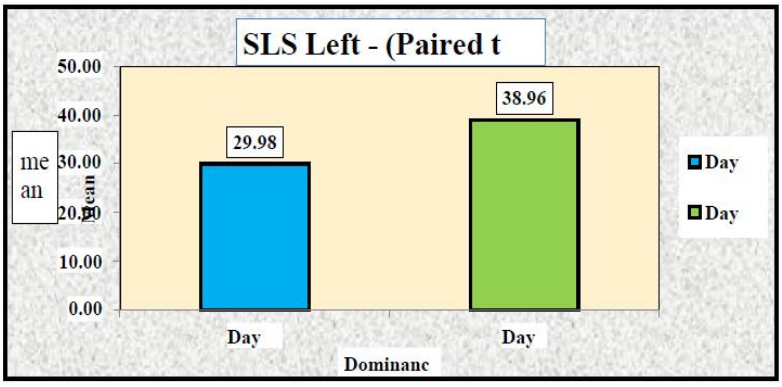


COMMENT- Graph no 3(evaluation of static balance on 1st day
Single leg stance [rt] on day 1 shows mean 41.27 with SD 20.47 (t value 7.00)
Single leg stance on day 14 shows means 32.96with SD 17.82 (t value 7.00)
There is increase in mean on day 14 and p value which should be less than 0.005,
the p value is 0.00 which is significant.

TABLE [N0 3] B COMPARISON OF STATIC BALANCE OF LEFT LEG ON DAY 1AND DAY 14 OF MENSTRUAL CYCLE USING SINGLE LEG STANCE TEST

Evaluation of static balance on day 1 and day 14 of menstrual cycle using single leg stance test.

Variable	Groups	N	Mean	SD	t value	p value
SLS Left	Day 1	45	38.96	20.58	4.12	0.000
	Day 1	45	29.98	17.61		

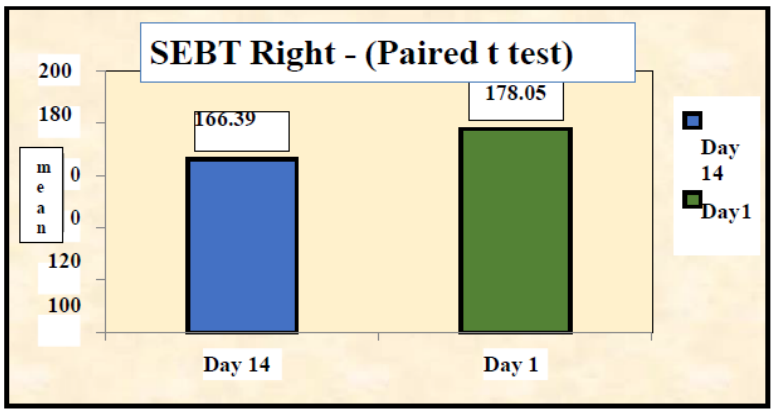


COMMENT-GRAPH 3] B) Evaluation of static balance on day 1 and day 14 of menstrual cycle usingsingle leg stance test.
Single leg stance [Left] on day 1 shows mean38.96 (t value 4.12) Single leg stance on day 14showsmean 29.98 with 20.58 (t value 4.12) There is increase in mean on day 14 and p value which should be less than 0.005, the p value is which is significant.

TABLE NO 4 [A] COMPARISON OF DYNAMIC BALANCE OF RIGHT LEGUSING STAR EXCURSION BALANCE TEST ON DAY 1 AND DAY 14.

SEBT Right - (Paired t test)

Variable	Groups	N	Mean	SD	t value	p value
SEBT Right	Day 1	45	178.05	20.89	3.86	0.000
	Day 14	45	166.39	16.62		

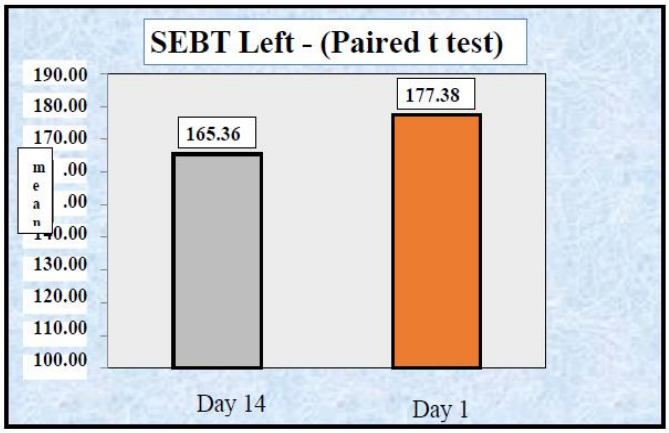


COMMENT -
GRAPH 4[A] Evaluation of dynamic balance using star excursion balance test
The SEBT (RIGHT) Leg Day 1 shows mean of 178.05.
Day 14 shows mean of 166.39
t valve is 3.86
The Day 14 shows increase in mean value as compared to Day 1.
The p value is 0.00.

The p value should be less than 0.005 which shows significant.

TABLE [4] B COMPARISON OF DYNAMIC BALANCE OF LEFT LEG ON DAY 1 AND DAY 14 OF MENSTRUAL CYCLE.

Variable	Groups	N	Mean	SD	t value	p value
SEBT Left	Day 1	45	177.38	25.09	4.58	0.000
	Day 14	45	165.36	24.55		



COMMENT-

GRAPH 4 B] Evaluation of dynamic balance using star excursion balance test

The SEBT (LEFT) Leg Day 1 shows mean of 177.38 with SD of 25.09.
Day 14 shows mean of 165.36 with SD of 24.55
t valve is 4.58
The Day 14 shows increase in mean value as compared to Day 1.
The p value is 0.00
The p value should be less than 0.005 which shows significant

TABLE NO 5) CORRELATION BETWEEN DYNAMIC BALANCE (SEBT RIGHT LEG) AND PRIMARY DYSMENORRHEA (WaLIDD SCORE) AT DAY 1 OF MENSTRUATION

SEBT RIGHT	WaLIDD SCORE	PEARSON CORRELATIONCOEFFICIENT	P VALUE
168.82±12.66	5.75±1.48	-0.2825	0.2891 (NOT SIGNIFICANT)

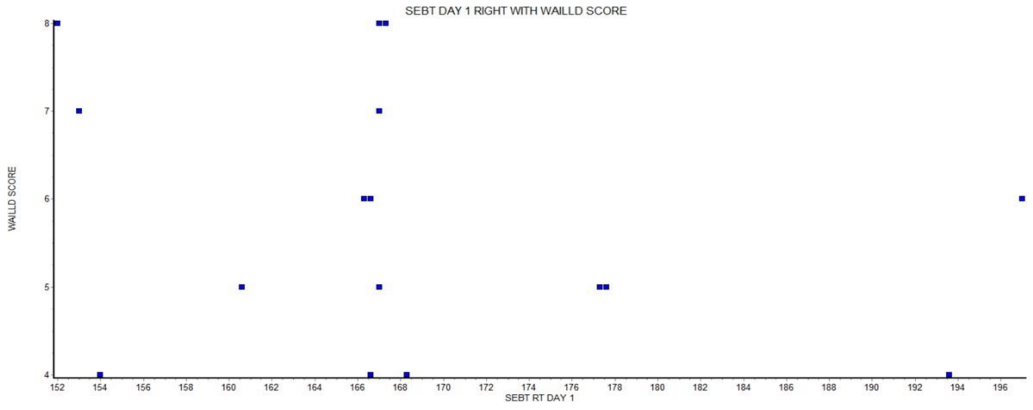


TABLE NO 5) B] COMMENT - CORRELATION BETWEEN DYNAMIC BALANCE (SEBT RIGHT LEG) AND PRIMARY DYSMENORRHEA (WaLIDD SCORE) AT DAY 14 OF MENSTRUATION

SEBT RIGHT	WaLIDDSCORE	PERSON CORRELATIONCOEFFICIENT	P VALUE
171.28125±13.973	**5.75±1.483**	**-0.5693**	**0.0214 (SIGNIFICANT)**

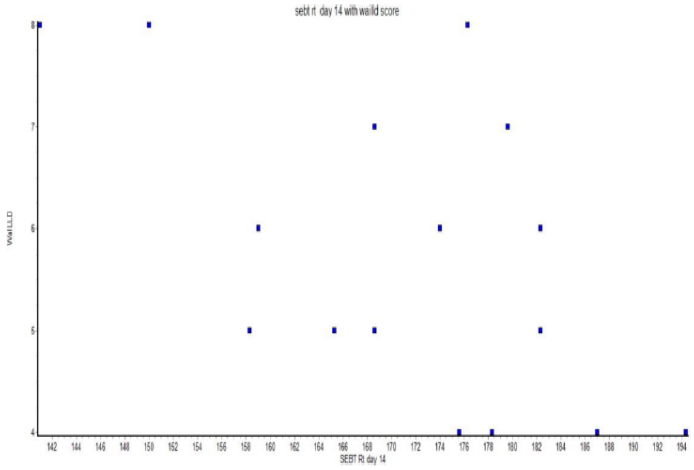


TABLE NO 6) A COMMENT- CORRELATION BETWEEN DYNAMIC BALANCE (SEBT LEFT LEG) AND PRIMARY DYSMENORRHEA (WaLIDD SCORE) AT DAY 1 OF MENSTRUATION

SEBT LEFT	WaLIDDSCORE	PEARSON CORRELATIONCOEFFICIENT	P VLAUE
1.64.75625±19.302	5.75±1.483	-0.05513	0.8393(NON-SIGNIFICANT)

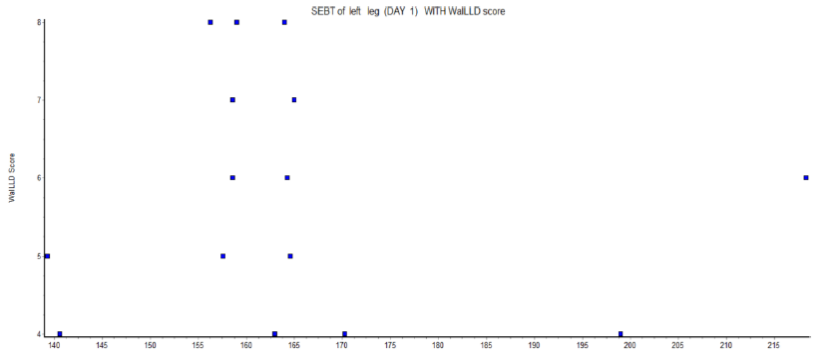
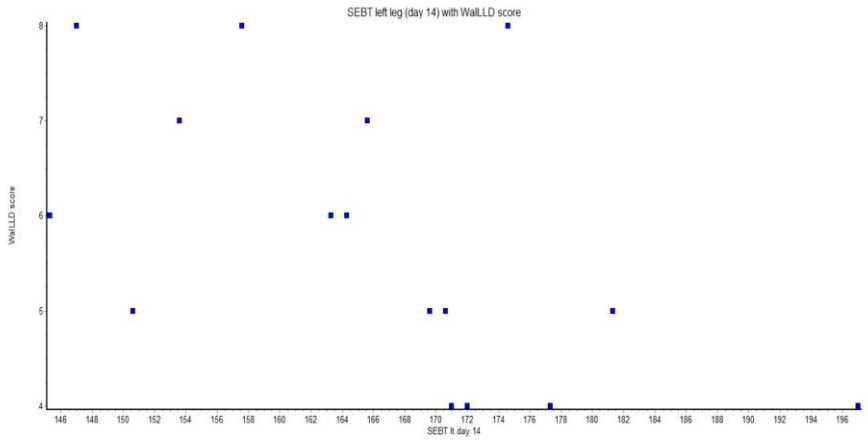


TABLE NO 6) B] COMMENT- CORRELATION BETWEEN DYNAMIC BALANCE (SEBT LEFT LEG) AND PRIMARY DYSMENORRHEA (WaLIDD SCORE) AT DAY 14 OF MENSTRUATION

SEBT LEFT	WaLIDDSCORE	PEARSON CORRELATIONCOEFFICIENT	P VLAUE
166.29375±13.544	5.75±1.483	-0.5440	0.0294(nON-SIGNIFICANT)



DISCUSSION

The main objective of the present study was to determine the static and dynamic balance during menstrual cycle and to find its co-relational with primary dysmenorrhea. Total 45 subjects according to inclusion and exclusion criteria were recruited in to the study. They were selected by purposive sampling technique. Outcome measure used were single leg stance balance test for static balance, single leg stance is used to assess the static postural and balance control, star excursion balance test was used for dynamic balance test. Star excursion test balance test is a dynamic test that requires strength, flexibility, and proprioception

Evaluation of static and dynamic balance during day 1 and day14 of menstrual cycle Static balance of day 14, t=7.00 p=0.000 and day 1 t=4.12 p=0.000 this shows balance decrease during day 14 as compared to day 1. Dynamic balance of day 14, t=3.86 p=0.000 and day 1 t=4.58 p=0.000, this shows that balance decrease on day 14 as compared to day 1. Therefore, static and dynamic balance get effects on day 14 as compared to day1 of menstrual cycle.

According to Mary Jane, Minkin M.D1992 at Yale school of medicines said that, high estrogen level causes your liver to make hormones that affects the kidneys and leads to fluid retention in your body and brain. This makes it difficult for you to keep your balanced during your menstrual cycle. To keep an erect posture control, select proper strategies but because of decreased stiffness and reduced stability the mensural structure is not able to provide feedback so may there is postural sway because of 17-beta estradiol during ovulation phase.

Dysmenorrhea is classified into two: Primary dysmenorrhea is defined as painful menstruation experienced by women with normal pelvic anatomy and Secondary dysmenorrhea is defined as who have pelvic pathology like endometriosis etc., In primary dysmenorrhea pain is spasmodic in nature and pain felt in suprapubic area [lower abdomen], it may radiate to lower back and thighs. The onset is usually 6 to 12 months after menarche with regular ovulatory cycle. The etiology of PD is not understood but most symptoms explained that increase amounts of prostaglandins, particularly PGF2 – AIFa. Spasmodic dysmenorrhea comes under the membranous dysmenorrhea which is characters by the endometrial action. The intensity of pain and symptoms of menstruation is directly proportional to the amount of PGF2 released. Vasopressin and leuko-triene concentration are higher in women who have severe menstrual pain than others. Vasopressin involved in myometrial hyperactivity, reduced blood flow which is secrete by posterior pituitary gland. The pain result from contraction of uterus when the blood supply to the endometrium is reduced and become worse as endometrial tissue shed and pass-through cervix. It occurs at monthly intervals throughout the reproductive life occurs in a normal cycle of 21 – 45 days with 2 – 6 days of flow, 20-60 ml of blood loss lasting in 40 years of their life. In modern times girls may have physical problems arise in relation with menstruation such as dysmenorrhea, weight gain, headache, backache, breast tenderness, mood swings, depression. It may often associate with problems and risk factors of irregular menstruation, excessive bleeding, nulliparity, smoking, attempt to weight loss, physical inactivity, disruption of social network, anxiety. Significantly higher in coffee consumers, menstrual bleeding more than 7 days, who also have positive history of dysmenorrhea or any other gynecological problems, extroverted uterus.

Estrogen and progesterone receptors are found in bone, skeletal, muscles, ligaments, neuro system and changes in their formulation affects the structure and function of these tissues. Correlation between primary dysmenorrhea & dynamic balance to find out correlation between dysmenorrhea and dynamic balance star excursion balance test was used, the p value of day 14 right leg was0.0214 and the p value of day 14 left leg was0.02959 which was significant. The study concludes that

balance is affected at 14th day of menstrual cycle as compared to 1 st day. There is moderate negative correlation exist between primary dysmenorrhea and dynamic balance. the fibers that
propagate the painful impulse have fast transmission and processing priority in the CNS, the other stimuli from the body are suppressed, such as proprioceptive ones8,15. Through this mechanism, pain compromises proprioception and, therefore, a higher alteration in the postural control of women with PD was expected in the closed eyes condition. As pain affects the somatosensory system [3], this causes decreased balance ability [3, 5]. Also, balance control and muscle inhibition pathways caused by pain share some pathways in the CNS [3, 5]. Therefore, muscle inhibition mechanisms caused by pain can adversely affect balance ability [5, 11]. Pain increases pre-synaptic inhibition of muscle afferents and affects the central modulation of the proprioceptive spindles of muscles [5, 11, 12]. These changes decrease muscle control and increase postural sway [11]. A recent study in which patients with shoulder pain were compared with healthy subjects showed that pain may also negatively affect balance by disrupting neural rate processing the findings of the study is in accordance with the study conducted by Hilal Keklicek et al. (2021) on Primary dysmenorrhea.
dysmenorrhea and postural control: Is it a problem only during menstruation? Concluded that primary dysmenorrhea is not only a problem for females during menstruation, primary dysmenorrhea causes impaired ability of the individual to perform dual-task in and continuously affects postural stability.

CONCLUSION

The study concludes that balance is affected at 14th day of menstrual cycle as compared to 1st day. There is moderate negative correlation exist between primary dysmenorrhea and dynamic balance

CLINICAL IMPLICATION

Moreover, when planning exercise programs for women, the menstrual cycle should be considered. During the menstrual cycle with the levels of female hormones being high, a balance training can be a part of exercise programs for females but the intensity should be controlled to reduce risk of injuries

LIMITATIONS

The study could have been carried out to find correlation between menstrual cycle and with primary dysmenorrhea in 3 phases of menstrual cycle. Consumption of analgesic for pain relief during menstrual cycle is not controlled.

SUGGESTION&FUTURE SCOPE

In future the effect of the female sex hormones on the sensation and nervous systems will be studied. Dynamic balance between primary dysmenorrhea & females without dysmenorrhea will be compared

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Conflict of Interest: None

Source of Funding: None

Ethical Approval: Approved

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