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Original Article

Effect of *Sharbat Afsantīn* in Poly Cystic Ovarian Disease - An Open Observational Study

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ABSTRACT

Objective: The objective of the study was to evaluate the effect of *Sharbat Afsantīn* in Polycystic Ovarian Disease.

Methods: An open observational study was carried out in the Department of Ilmul Qabalat wa Amraze Niswan. Diagnosed cases(n=30) of PCOD were included in the study. Patients with thyroid dysfunction, systemic diseases, on hormonal treatment in last three months, pregnancy and lactation were excluded. Research drug (*Sharbat Afsantīn*) was administered orally in a dose of 25ml twice daily for 15 days/cycle for three consecutive cycles. Outcome measures were, changes in subjective parameters (duration of cycle, duration and amount of flow and weight reduction) and objective parameters {pictorial blood loss assessment chart (PBAC) score, basal metabolic index (BMI), modified Ferriman Gallwey (mFG) score, acanthosis nigricans scale and pelvic ultrasonography}. Data were analyzed using paired Student 't' test.

Results: Changes in duration of cycle, duration and amount of flow were achieved in 83.3%, 50% and 40% patients respectively and weight reduction in 30% patients. Changes in PBAC score and BMI were achieved in 50% and 30% patients respectively and 30% patients showed normal findings on pelvic ultrasonography.

Conclusion: *Sharbat Afsantīn* can be used as an alternate remedy in PCOD patients, as it has significant effect to regularize menstruation by reduction in BMI and probably by improving insulin resistance in PCOD. No adverse effect of *Sharbat Afsantīn* was noted during the trial.

Keywords PCOD, *Sharbat Afsantīn,* PBAC, BMI, Pelvic Ultrasonography.

INTRODUCTION

In classical Unani literature Polycystic Ovarian Disease (PCOD) has been described under *Iḥtibās-al-Ṭamth* and '*Uqr* (Baghdadi, 2007; Khan, 2003; Razi, 2001; Jurjani, 2010; Khan & Begum, 2019). It is caused by *Sū'-i-Mizāj-Kabid*, dominance of *Khilṭ-Balgham* (Baghdadi, 2007; Khan & Begum, 2019; Firdose & Shameem, 2016) and when a woman's *Mizāj* is transformed towards masculinity (Khan, 2003; Razi, 2001). *Usūle'Ilāj* comprises of Idrār-i-Ḥayḍ (Mudirr-i-Ḥayḍ drugs), *Ta'dīl-i-Mizāj* (*Munḍij-wa-Mushil-i-Balgham drugs*), weight-reduction, herbal insulin sensitizers etc. (Firdose & Shameem, 2016). *Afsantīn* was selected as research drug to improve the symptoms of PCOD, as it acts as emmenagogue (*Mudirr-i-Hayḍ*) (Ghosh, Mitra & Mitra, 2013; Terra *et al.,* 2007), de-obstruent (*Mufattiḥ-i-Sudad*), anti-inflammatory (*Muḥallil*) ("Artemisia vulgaris", 2009), uterine-stimulant (Nadkarni, 2009), antidiabetic (Correa-Ferreira, Noleto & Petkowicz, 2014), antioxidant (Ghosh, Mitra & Mitra, 2013; Terra *et al.,* 2007; Abedulla, 2015), hepatoprotective (Nadkarni, 2009), etc. The objective of the study was to evaluate clinically the effect of *Afsantīn* in the management of PCOD and hypothesis tested was *Afsantīn* may be effective in the management of PCOD.

Material and Methods

Study design: An open observational study was carried out in the Department of Ilmul Qabalat wa Amraze Niswan, from Nov 2019 - March 2020. The study was initiated after obtaining approval from Institutional Ethical Committee, under IEC No. NIUM/IEC/2017-18/014/ANQ/06 and the trial was registered at CTRI under no: CTRI/2019/03/017970.

Sample size estimation: Sample size was calculated for single group with pre and post assessment of duration of cycle. From

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the previous study, mean of DOC was 35.50 with SD of 10.37 (Khan & Begum, 2019). The sample was calculated from the formula: n=2[(Zα-Zβ) SD/μ1-μ2]2. It was validated from thumb rule for calculation of sample size i.e. (SD/μ1-μ2)2 ×20 for 95% confidence limit. It was found to be 28.57~ 30. So, the sample size was fixed at 30 in the group.

Selection criteria: Diagnosed cases (n=30) of PCOD in age group of 18-35 years were included in the study and patients with thyroid dysfunction, systemic diseases, on hormonal treatment in last 3 months, pregnant and lactating women were excluded by performing Hb%, UPT, FBS and TSH.

Procedure of the study: PCOD patients presenting with menstrual irregularities (oligo/ amenorrhea), weight gain, hirsutism, hyper pigmented thick velvety patches in the body folds and creases especially in the nape of the neck, were evaluated at Gynec OPD of our Hospital. 30 diagnosed cases of PCOD were selected and written informed consent was obtained from them. On entry into the study, details of menstrual history including age at menarche, pattern of menstrual cycle (nature and duration of cycle, duration and amount of flow) and history of weight gain were inquired. On physical examination, nutritional status, BMI, hirsutism score, acanthosis nigricans score and vitals were recorded; *Mizāj* of each subject was assessed according to the parameters mentioned in classical Unani literature. SES was assessed by Kuppuswamy's socioeconomic status scale. All information obtained were recorded in the CRF designed for the study. After evaluation, patients were advised for necessary investigations such as USG Pelvis, AST, ALT, Alkaline Phosphatase, Blood Urea, and Serum Creatinine.

Intervention: *Afsantīn* (*Artemisia vulgaris* Linn) was selected as research drug. It was purchased in crude form from the local drug market and submitted to the Dept. of Ilmul Saidla (Pharmacy) for preparation of *Sharbat* and the same was sent to FRLHT for drug identification (FRLHT Acc. No. 5529) *Afsantīn* - 400 g and sugar - 2 kg (Anonymous, 1986) were taken and *Sharbat* was prepared in the pharmacy as per the method mentioned in classical text. 25ml of *Sharbat Afsantīn* was administered orally twice a day for 15 days/cycle for three cycles and observed for commencement of menstruation in next 15 days. *Sharbat Afsantīn* -750ml was dispensed in 1 litre plastic bottle for 15 days and patients were instructed to come back after 30 days for follow-up and to collect the drug for the next cycle. Compliance to treatment was assessed at follow up visit with the container in which the drug was dispensed at earlier visit, even though the palatability of the drug was not so appreciative.

Subjective parameters: Improvement in duration of cycle (from longer to shorter), duration of flow (from minimum to maximum) and amount of flow (from spotting/ scanty to moderate/ heavy) were assessed at every follow-up visit and weight reduction (5% change in body weight) during the trial.

Objective parameters: At every visit, PBAC score (Davies & Kadir, 2017), BMI (Purnell, 2000), mFG score (Swingler, Awala & Gordon, 2009) and acanthosis nigricans scale (Armstrong *et al*., 2016) were assessed during the trial and USG pelvis was done after the treatment. (Changes in pelvic scan was considered when ovaries were normal without PCO on post treatment scan).



Fig. 1. *Afsantīn* Plant (Terra *et al.*, 2007; Correa-Ferreira, Correa-Ferreira, Noleto & Petkowicz, 2014)

Assessment of efficacy: Effectiveness of the trial was assessed by the following parameters.

Primary outcome measures: Changes in subjective parameters (duration of cycle, duration of flow, amount of flow and weight reduction) as yes or no.

Secondary outcome measures: Changes in objective parameters (PBAC score, BMI, mFG score, acanthosis nigricans scale and USG pelvis) as yes or no.

Adverse effect documentation: No adverse reaction of the drug was noted during the trial.

Statistical methods: Descriptive and inferential statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean ± SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at 5% level of significance. Student 't' test (two tailed, dependent) has been used to find the significance of study parameters on continuous scale within each group (Abedulla, 2015). The Statistical software namely SPSS 22.0, and R environment ver.3.2.2 were used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables etc.

RESULTS

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Total 60 patients were assessed for eligibility, 22 denied to participate and 38 were evaluated through investigations; 3 patients were excluded for not meeting the inclusion criteria and 35 were enrolled in the study; 5 patients dropped out, 29 patients completed the trial and 1 patient was loss to follow up, but included in the analysis by last observation carry forward method.

Table 1. Demographic Data of Patients Studied

Demographic Data	No. of patients (n=30)	%
Age in years (Mean ±SD:23.57 ±4.76)		
• 18-26	23	76.7
• 27-35	7	23.3
Age of Menarche (Mean ± SD: 13.27±1.23)		
• < 12Years	1	3.3
• 12-14 Years	24	80
• > 14 Years	5	16.7
Marital Status		
• Married	17	56.7
• Single	13	43.3
Socio Economic Status		
• Lower	1	3.3
• Lower Middle	19	63.3
• Upper Lower	1	3.3
• Upper Middle	9	30.0
Educational Status		
• Illiterate	1	3.3
• Primary	8	26.7
• Secondary	8	26.7
• High School	9	30.0
• Graduate	4	13.3
Mizāj		
• *Balghami*	28	93.3
• *Damwī*	2	6.7
F/h/o PCOD		
• Absent	26	86.7
• Present	4	13.3

Data are presented as number (percentage), Student 't' test (two tailed, dependent)

Subjective Parameters

Table 2(a). Effect of Research Drug on Duration of Cycle (Days)

Duration of Cycle (Days)	Before Treatment	First Cycle	Second Cycle	Third Cycle	After Treatment
Min-Max	37.00-53.00	18.00-96.00	12.00-06.00	25.00-67.00	25.00-49.00
Mean ± SD	73.77±29.37	48.29±26.18	39.28±21.92	36.04±10.25	36.57±22.69
Difference	-	30.333	34.2	34.964	36.5
P value	-	0.001**	<0.001**	<0.001**	<0.001**

Values are mentioned as Mean ± SD, Student t test (two tailed, dependent), ** Strongly significant

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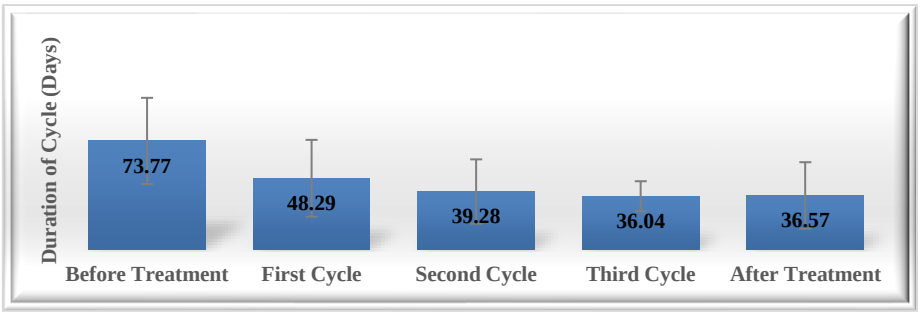


Fig. 2 (a_1). Effect of Research Drug on Duration of Cycle (Days)

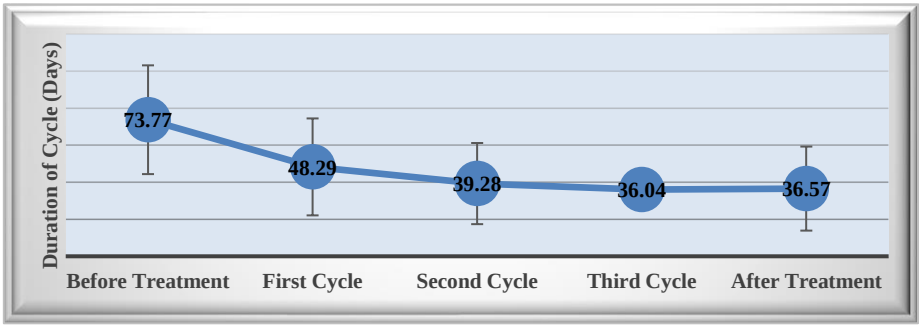


Fig. 2 (a_2). Effect of Research Drug on Duration of Cycle (Days)

Table 2(b). Effect of Research Drug on Duration of Flow (Days)

Duration of Flow (Days)	Before Treatment	First Cycle	Second Cycle	Third Cycle	After Treatment
Min-Max	1.00-6.00	0.00-6.00	0.00-8.00	0.00-8.00	0.00-8.00
Mean ± SD	3.27±1.64	3.37±2.50	4.23±2.28	5.00±1.66	5.07±1.66
Difference	-	-0.1	-0.967	-1.733	-1.8
P value	-	0.837	0.044*	<0.001**	<0.001**

Values are mentioned as Mean ± SD, Student 't' test (two tailed, dependent), * Moderately significant.

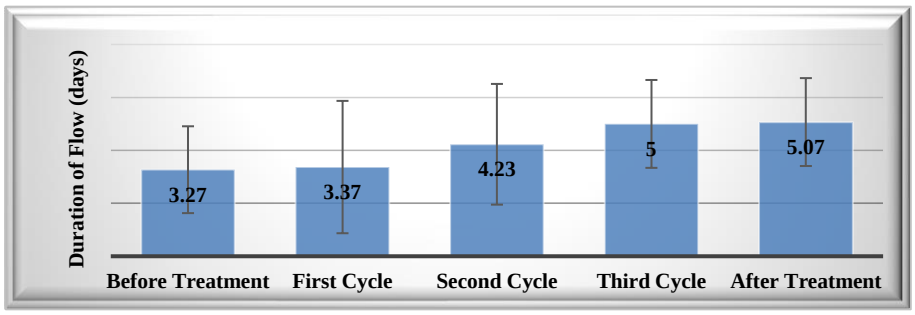


Fig. 2 (b_1). Effect of Research Drug on Duration of Flow (Days)

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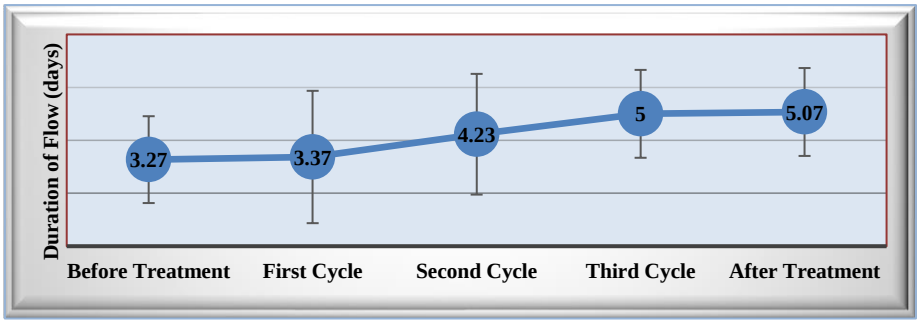


Fig. 2 (b_2). Effect of Research Drug on Duration of Flow (Days)

Table 2(c). Effect of Research Drug on Amount of Flow (Grading)

AOF (Grading)	Before Treatment	First Cycle	Second Cycle	Third Cycle	After Treatment	% difference
No	0(0%)	9(30%)	5(16.7%)	2(6.7%)	2(6.7%)	6.7%
Mild	12(40%)	10(33.3%)	15(50%)	17(56.7%)	18(60%)	20.0%
Moderate	5(16.7%)	7(23.3%)	7(23.3%)	11(36.7%)	10(33.3%)	16.6%
Severe	13(43.3%)	4(13.3%)	3(10%)	0(0%)	0(0%)	-43.3%
Total	30(100%)	30(100%)	30(100%)	30(100%)	30(100%)	-

Data are presented as number (percentage), Student 't' test (two tailed, dependent), (AOF-Amount of flow)

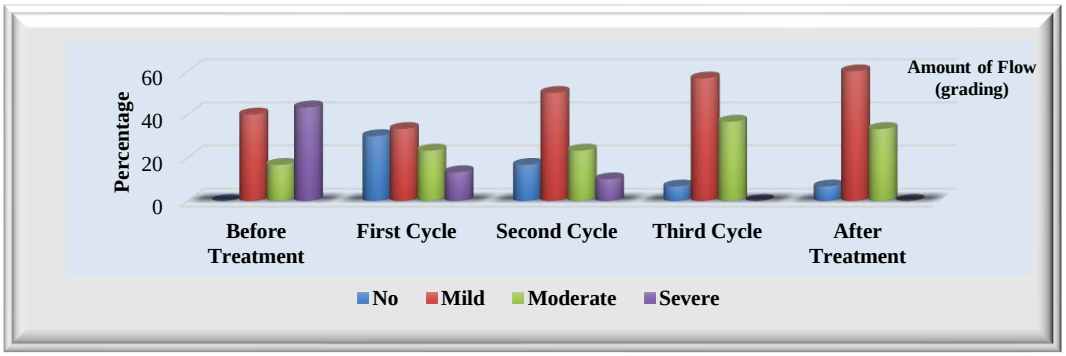


Fig. 2 (c). Effect of Research Drug on Amount of Flow

Table 2(d). Effect of Research Drug on Body Weight

Body Weight	Before Treatment	First Cycle	Second Cycle	Third Cycle	After Treatment
Min-Max	37.00-94.00	37.00-94.00	37.00-94.00	37.00-94.00	37.00-94.00
Mean ± SD	67.60±14.94	67.17±15.05	66.47±15.15	65.97±15.07	65.73±15.09
Difference	-	0.433	1.133	1.633	1.867
P value	-	0.013*	0.001**	<0.001**	<0.001**

Values are mentioned as Mean ± SD, Student 't' test (two tailed, dependent)

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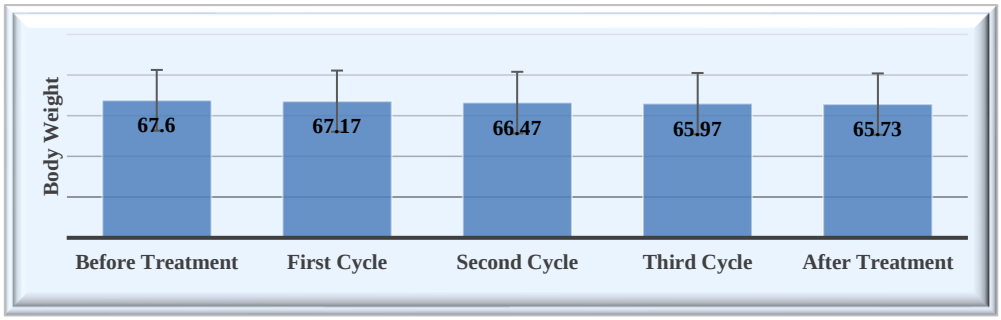


Fig. 2 (d_1). Effect of Research Drug on Body Weight

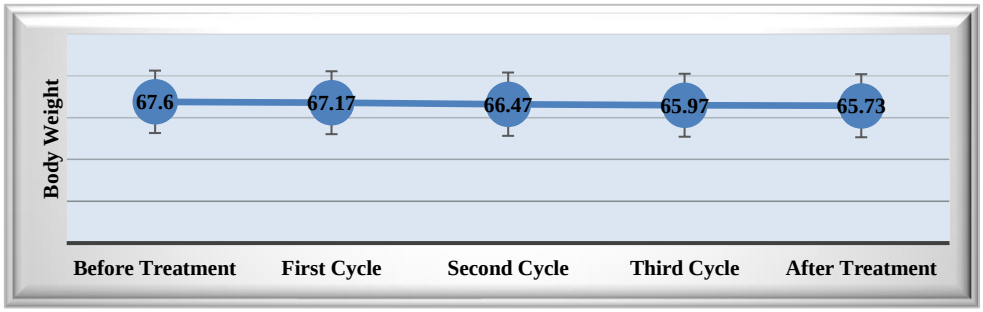


Fig. 2 (d_2). Effect of Research Drug on Body Weight

Table 3. Effect of Research Drug on PBAC Score

PBAC Score	Before Treatment	First Cycle	Second Cycle	Third Cycle	After Treatment
Min-Max	1.00-205.00	0.00-185.00	0.00-240.00	0.00-245.00	0.00-280.00
Mean ± SD	72.63±69.65	65.43±63.55	86.43±64.06	100.67±48.82	105.27±49.09
Difference	-	7.2	-13.8	-28.033	-32.633
P value	-	0.585	0.341	0.042*	0.035*

Values are mentioned as Mean ± SD, Student 't' test (two tailed, dependent), (PBAC-Pictorial Blood Loss Assessment Chart)

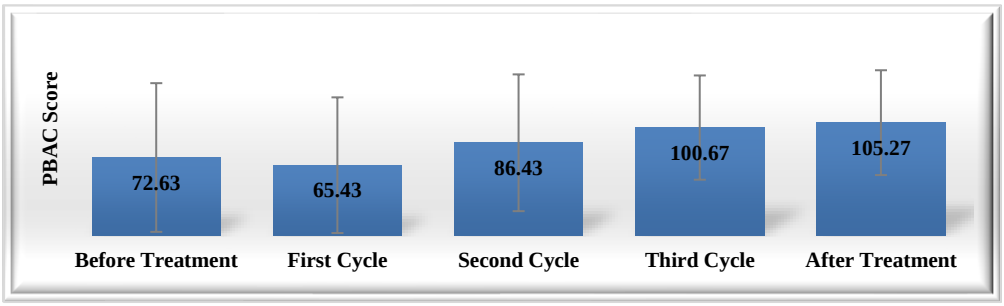


Fig. 3 (a_1). Effect of Research Drug on PBAC Score

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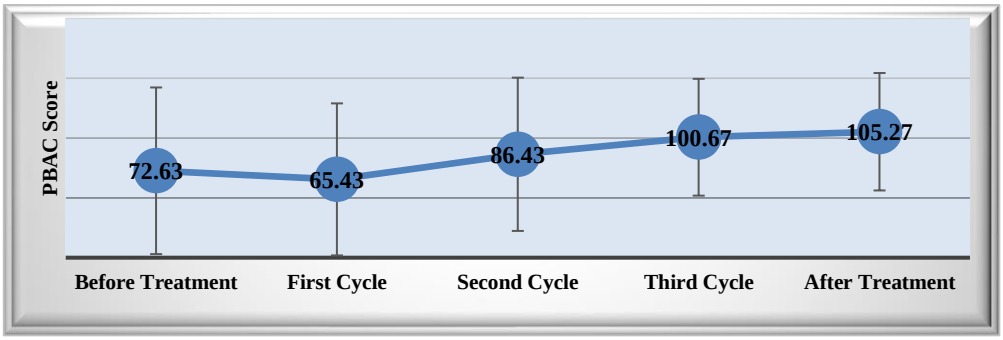


Fig. 3 (a_2). Effect of Research Drug on PBAC Score

Table 4. Effect of Research Drug on BMI

BMI	Before Treatment	First Cycle	Second Cycle	Third Cycle	After Treatment
Min-Max	16.02-37.32	15.22-37.32	15.22-37.32	16.02-37.32	16.02-37.32
Mean ± SD	28.24±5.74	28.05±5.76	27.72±5.78	27.52±5.73	27.42±5.76
Difference	-	0.188	0.512	0.715	0.811
P value	-	0.014*	<0.001**	<0.001**	<0.001**

Values are mentioned as Mean ± SD, Student 't' test (two tailed, dependent), (BMI-body mass index)

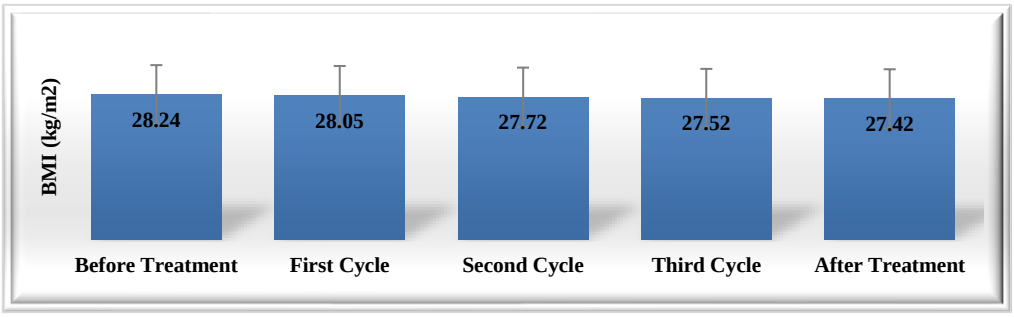


Fig. 4 (b_1). Effect of Research Drug on BMI

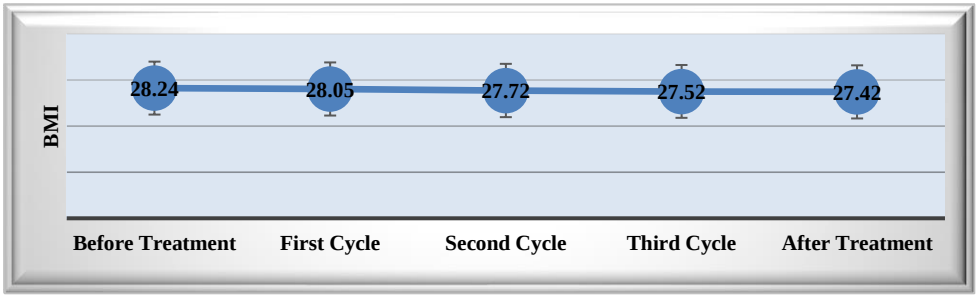


Fig. 4 (b_2). Effect of Research Drug on BMI

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Table 5. Effect of Research Drug on Objective Parameters

Objective Parameters	Before Treatment	After Treatment	difference	P value
mFG score	9.60±6.13	9.30±5.83	0.300	0.059+
AN Scale	2.23±1.43	2.00±1.31	0.233	0.006**
Right Ovarian Volume (cc)	11.77±4.43	10.86±3.17	0.501	0.476
Left Ovarian Volume (cc)	11.67±3.69	11.29±3.88	-0.138	0.851

Values are mentioned as Mean ± SD, Student 't' test (two tailed, dependent), + Suggestive significant (mFG-modified Ferriman Gallwey, AN-Acanthosis Nigricans)

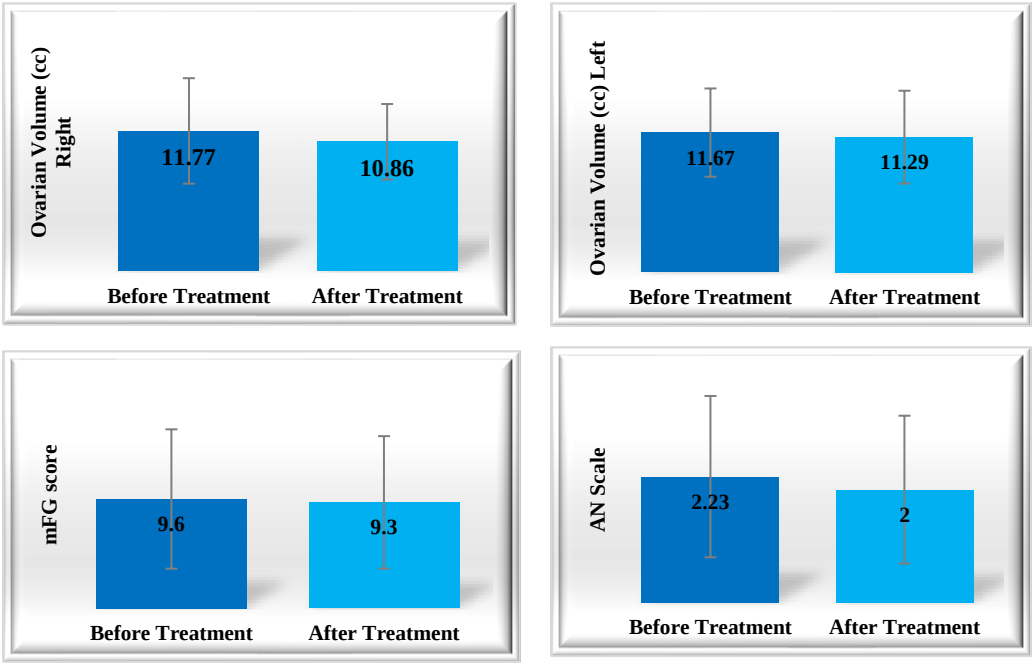


Fig. 5. Effect of Research Drug on Objective Parameters

Table 6. Effect of Research Drug on Safety Profile

Safety Profile	Before Treatment	After Treatment	difference	P value
AST	18.83±3.94	20.17±6.09	-1.333	0.200
ALT	19.33±5.09	22.77±9.53	-3.437	0.034*
Alkaline Phosphatase	95.40±27.34	89.07±13.98	6.333	0.264
Blood Urea	20.20±3.97	22.37±3.49	-2.167	0.006**
Serum Creatinine	0.79±0.13	0.75±0.09	0.040	0.078+

Values are mentioned as Mean ± SD, Student 't' test (two tailed, dependent)

Table 7. Effect of Research Drug on Primary Outcome Measures

Primary Outcome Measures(Changes in SP)	No. of patients(n=30)	%
• **Duration of Cycle**	25	83.3
• **Duration of Flow**	15	50.0
• **Amount of Flow**	12	40.0
• **Weight Reduction**	9	30.0

Data are presented as number (percentage), Student 't' test (two tailed, dependent)SP-Subjective Parameters)

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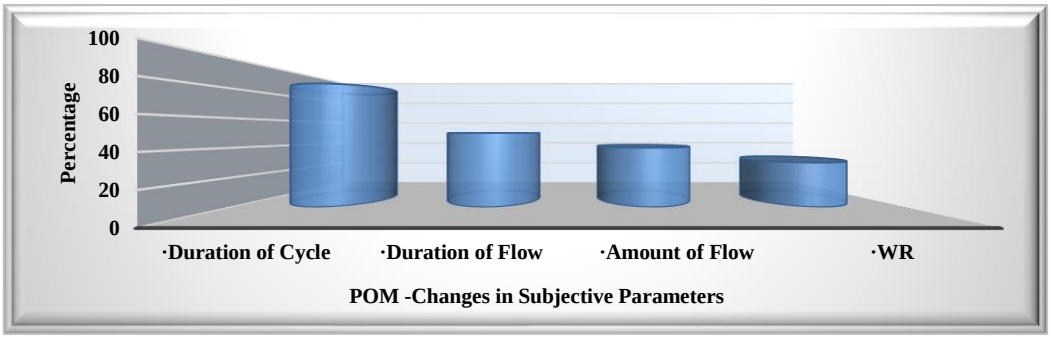


Fig. 6. Effect of Research Drug on Primary Outcome Measures (WR-weight reduction)

Table 8. Effect of Research Drug on Secondary Outcome Measures

Secondary Outcome Measures (Changes in OP)	No. of patients(n=30)	%
• **PBAC**	15	50.0
• **BMI**	9	30.0
• **mFG**	0	0.0
• **AN**	0	0.0
• **USG Pelvis**	9	30.0

Data are presented as number (percentage), Student 't' test (two tailed, dependent)(OP-Objective Parameters)

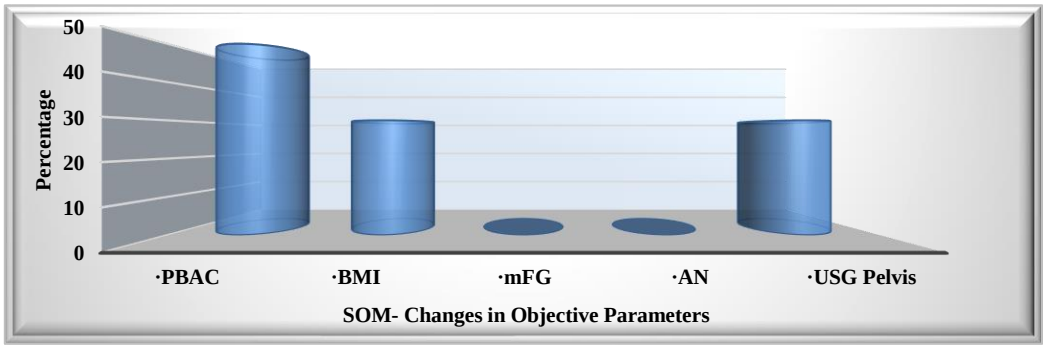


Fig. 7 Effect of Research Drug on Secondary Outcome Measures

DISCUSSION

Main findings: In this study, it was observed that changes in duration of cycle, duration of flow and amount of flow was achieved in 83.3%, 50% and 40% patients respectively and weight reduction in 30% patients. Changes in PBAC score and BMI were achieved in 50% and 30% patients respectively and 30% PCOD patients showed normal findings in USG pelvis.

Demographic data: Majority of patients (76.7%) were in the age group of 18-26 years and remaining 23.3% were in 27-35 years of age. The Mean ±SD of age was 23.57±4.76. This is in accordance with Bhat, Raza and Shahabuddin (2015) reported 23.55±0.76 and 23.6±1.11 in two groups, Ghavi, Taghizadeh, Taebi and Abdolahian (2019) reported 23.60±2.32 and 23.14±2.7 in two groups. Naeimi *et al.* (2018) reported 24.4±4.1 and Khan and Begum (2019) reported 24.80 ± 5.0 and 22.95± 5.57 in two groups.

Mean age of menarche was 13.27±1.23, which is in agreement with Khomami, Tehrani and Hashemi (2015) reported 13.14±1.56 years, Khatoon and Shameem (2017) reported 13.2±1.92 and Naeimi *et al.* (2017) reported 13.4±1.11 years.

Majority of patients, 56.7% were married and 43.3% were single. Bhat, Raza and Shahabuddin (2015) reported 55% and 45% in test group and 53.34% and 46.66% in control group, which is in consonance with the present study.

Maximum patients, 63.3% belonged to lower middle class, 30% from upper middle and 3.3% each from upper lower and lower class respectively.

30% patients had completed high school education, 26.7% each had completed primary and secondary education, 13.3% were graduates, and only 3.3% were illiterate.

Maximum patients (93.3%) had *Balghamī Mizāj* and only 6.7% had *Damwī Mizāj*. Bhat, Raza and Shahabuddin (2015) reported *Balghamī Mizāj* in 80% each and *Damwī Mizāj* 20% each in both groups. This coincides with the theory proposed

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by eminent Unani Scholars that PCOD is caused by the accumulation of abnormal *Balgham* secondary to *Ḍu'f al Jigar* (liver dysfunction) (Baghdadi, 2007; Khan & Begum, 2019; Firdose & Shameem, 2016).

Most of the patients, 86.7% had no family h/o PCOD, and only 13.3% had positive family h/o PCOD. This is in accordance with Bhat, Raza and Shahabuddin (2015) reported 82.5% and 17.5% patients in test group and 83.34% and 16.66% patients in control group had negative and positive family h/o PCOD respectively. (Table.1)

Subjective parameters: Mean ± SD of duration of cycle before treatment, 1st, 2nd and 3rd cycle of treatment and after treatment were 73.77±29.37, 48.29±26.18, 39.28±21.92, and 36.04±10.25 respectively. Significant improvement in duration of cycle was observed during the trial (p <0.001**). This may be due to the uterine stimulant (Terra *et al*., 2007), emmenogogue (Mensah *et al.,* 2015; Lee *et al.,* 1998) properties of the research drug and *Mizāj* of the drug is Hot 2º Dry 3º (Kabiruddin, 2007), Hot≤ 2 ºDry1º /2º ("*Artemisia vulgaris"*, 2009). As *Mizāj* of disease is cold and moist, hence hot and dry temperament drug was used as *Ilaj bi'l Ḍidd* as per Unani concept. Khan and Begum (2019) reported 62.50 ± 17.88 and 32.45 ± 9.84 before and after treatment in test group and 56.25±12.55 and 35.50±10.37 in control group. Khatoon and Shameem (2017) reported 49.17 ±32.71, 90.17 ±30.82, 64.45±47.14, 55.43±50.14 and 45.07±43.62 respectively before treatment, 1st, 2nd, 3rd cycles of treatment and after treatment. (Table.2a)

Mean ± SD of duration of flow before treatment, after 1st, 2nd and 3rd cycle of treatment and after treatment were 3.27±1.64, 3.37±2.50, 4.23±2.28, 5.00±1.66 and 5.07±1.66 respectively, p=0.837(non-significant) after 1st cycle, p=0.044 (moderately significant) after 2nd cycle, p <0.001(strongly significant) after 3rd cycle of treatment and even after treatment. The finding is similar to the study of Khatoon and Shameem (2017) reported 4.37±1.54, 2.79±2.53, 4.52±2.00, 4.11±1.45 and 4.73±2.51 respectively. Shayan, Masoumi, Shobeiri, Tohidi and Khalili (2016) 3.66±0.54, 5.26±1.2, 6.28±1.04 and 6.66±0.628 in test group and 3.56±0.59, 5.45±1.26, 6.28±1.02 and 6.65±0.633 in control group. (Table.2b)

At baseline, 16.7% patients had moderate flow during period, which was increased to 23.3% each in 1st and 2nd cycle, 36.7% in 3rd cycle and 33.3% after treatment with a percentage difference of 16.6%; 40% patients had mild flow during period, which was increased to 33.3%,50%, 56.7% and 60% in 1st, 2nd, 3rd cycle & after treatment with a percentage difference of 20%; amount of flow was increased to 30% ,16.7% and 6.7% in 1st, 2nd ,3rd cycle and even after treatment with a percentage difference of 6.7%.(Table.2c)

Mean ± SD of body weight before treatment, after 1st, 2nd and 3rd cycle of treatment and after treatment were 67.60±14.94, 67.17±15.05, 66.47±15.15, 65.97±15.07 and 65.73±15.09 respectively. A strong significant reduction in body weight (p<0.001) was observed during the trial. Bhat, Raza and Shahabuddin (2015) reported 65.45±12.49 and 63.7±11.501 before and after treatment which is similar to this study. (Table.2d)

Objective parameters: Mean ± SD of PBAC score before treatment, after 1st, 2nd and 3rd cycle of treatment and after treatment were 72.63±69.65, 65.43±63.55, 86.43±64.06, 100.67±48.82 and 105.27±49.09 respectively. Moderately significant improvement in PBAC score was observed after 3rd cycle (p=0.042) and post treatment (p=0.035). Khatoon and Shameem (2017) reported 94.03±63.65, 50.53±59.38, 87.90±82.06, 87.40±57.43 and 103.97±79.99 respectively which matched with this study. (Table.3)

Mean ± SD of BMI before treatment, after 1st, 2nd and 3rd cycle of treatment and after treatment were 28.24±5.74, 28.05±5.76, 27.72±5.78, 27.52±5.73 and 27.42±5.76 respectively. Significant improvement in BMI (p <0.001) was observed during the trial. This finding is in accordance with the study of Khatoon and Shameem (2017) reported 29.71±3.87 and 28.89±3.75 in 3 months, Bhat, Raza and Shahabuddin (2015) reported 28.41±0.74 and 27.55±0.6847 in 3 months. Stener-Victorin, Jedel, Janson and Sverrisdottir (2009) reported 27.5±8.6 and 27.6±8.8 in 1st group, 26.8±4.8 and 26.4±4.8 in 2nd group and 28.0±6.2 and 28.5±6.2 in 3rd group respectively in 4 months. Significant reduction in BMI may be due to *Mudirr-i-Bawl* (Anonymous, 1992; Kabiruddin, 2007) *wa Hayḍ* (Emmenagogue) (Kabiruddin, 2007), *Mufattiḥ-i-Sudad* (Deobstruent) (Anonymous, 1992; Kabiruddin, 2007), *Muḥallil* (Resolvent) (Kabiruddin, 2007), antihyperlipidemic (Abedulla, 2015), hypoglycaemic (Ghosh, Mitra & Mitra, 2013) hepatoprotective (Terra *et al*., 2007) and diaphoretic ("*Artemisia vulgaris"*, 2009) properties of research drug. (Table.4)

The Mean ± SD of mFG score of hirsutism before and after treatment were 9.60±6.13 and 9.30±5.83 respectively with p=0.059, considered suggestive significant reduction in mFG score.

The Mean ± SD of acanthosis nigricans scale before and after treatment were 2.23±1.43 and 2.00±1.31 respectively with p=0.006 (SS). This effect may be due to antihyperlipidemic (Abedulla, 2015), hypoglycaemic (Ghosh, Mitra & Mitra, 2013) & hepatoprotective (Terra *et al*., 2007) properties of research drug.

Before and after treatment, mean ± SD of right ovarian volume were 11.77±4.43 and 10.86±3.17 respectively with p=0.476 (NS), and left ovarian volume were11.67±3.69 and 11.29±3.88 respectively with p=0.851(NS). Ghavi, Taghizadeh, Taebi and Abdolahian (2019) reported 10.30±2.63 and 8.17±3.32 of right ovarian volume and 10.67±3.02 and 8.26±3.06 of left ovarian volume in test group and 9.04±3.26 and 9.91±3.58 of right ovarian volume and 8.73±2.25 and 8.88±3.08 of left ovarian volume in control group, Khatoon and Shameem (2017) reported 11.85±4.13 and 10.80±3.77 of right ovarian volume and 12.79±4.39 and 10.66±4.47 of left ovarian volume. (Table.5)

Safety profile: Research drug was safe as all safety parameters were within normal limits. Even though moderately significant increase in ALT (p=0.034), strong significant increase in blood urea (p=0.006) and suggestive significant reduction in serum creatinine (p=0.078) were noted. Also, no adverse effect of research drug was noted during the trial. This validates the safety of the research drug as it is proved to be hepato-protective. (Terra *et al*., 2007). (Table.6)

Primary outcome measures: Changes in duration of cycle, duration of flow and amount of flow was achieved in 83.3%, 50% and 40% patients respectively and weight reduction was noted in 30% patients. (Table.7)

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Secondary outcome measures: Changes in PBAC score and BMI was achieved in 50% and 30% patients respectively and 30% PCOD patients showed normal findings in USG pelvis. Khatoon and Shameem (2017) reported 20% patients had no PCOD on pelvic ultrasonography after treatment. (Table.8) Improvement in outcome measures is attributed to *Mudirr-i-hayḍ* (Emmenagogue) (Kabiruddin, 2007), *Mufattiḥ-i- Sudad* (Deobstruent) (Anonymous, 1992; Kabiruddin, 2007), *Muḥallil* (Resolvent), *Musakkin-i-Dard*(Analgesic), *Muqawwī-i-Dimāgh wa Jigar* (strengthen the brain and liver) (Kabiruddin, 2007), emmenogogue (Mensah *et al.,* 2015; Lee *et al.,* 1998), uterine stimulant, hepatoprotective (Terra *et al*., 2007), antidiabetic (Ghosh, Mitra & Mitra, 2013), antioxidant (Ghosh, Mitra & Mitra, 2013; Terra *et al*., 2007; "*Artemisia vulgaris"*, 2009; Abedulla, 2015), CNS stimulant (Govindaraj, Kumari, Cioni & Flamini, 2008), antispasmodic (Ghosh, Mitra & Mitra, 2013; Govindaraj, Kumari, Cioni & Flamini, 2008; Govindaraj S & Kumari, 2013), anticoagulant (Mensah *et al.,* 2015), antihyperlipedemic (Abedulla, 2015), immunity enhancer (Terra *et al*., 2007) and tonic(Ghosh, Mitra & Mitra, 2013) properties of research drug, and the drug should possess all these activities to have an effect on PCOD. Moreover, research drug contains estrogenic flavonoids (eriodictyol and apigenin) (Lee *et al.,* 1998) flavonoids, (Terra *et al*., 2007, Mensah *et al.,* 2015) phenols, glycosides (Anonymous, 1992), tannins and saponins (Terra *et al*., 2007; Anonymous, 1992), coumarins (Govindaraj, Kumari, Cioni & Flamini, 2008; Govindaraj S & Kumari, 2013), sesquiterpene lactones, volatile oils, etc. (Govindaraj S & Kumari, 2013) which probably may act on various parameters of PCOD.

CONCLUSION

Sharbat Afsantīn can be used as an alternate remedy in PCOD patients, as it has significant effect on menstrual regulation by reduction in BMI and probably by improving insulin resistance in PCOD.

Strength of the study: This is the initial study conducted to assess the effect of *Afsantīn* in the form of *Sharbat* in women with PCOD. Even though it was a trial of a short duration, improvement was observed in duration of cycle, duration of flow, amount of flow, BMI, mFG score and AN scale with no adverse effects.

Limitations of the study: Small sample size, short duration of treatment, short period of follow up and also *Sharbat Afsantīn* was immensely bitter.

Future recommendations: Randomized standard controlled trial on large sample size for longer duration with follow up for longer period for better assessment. *Afsantīn* can be administered in a more palatable form rather than *Sharbat.* Mechanism of action of research drug needs to be studied.

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CONFLICT OF INTEREST

Non declared.

ETHICAL APPROVAL

The study was started after obtaining approval from Institutional Ethical Committee under IEC No. NIUM/IEC/2017-18/014/ANQ/06 and the trial was registered at CTRI under no: CTRI/2019/03/017970.

AUTHORS' CONTRIBUTION

All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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