

# Effect of auriculotherapy on menstrual irregularities in single girls with polycystic ovarian syndrome and aged 18-35 years in Isfahan in 2012

Mahboubeh Valiani<sup>1</sup>, Imaneh Khaki<sup>2</sup>, Zahra Shahshahan<sup>3</sup>, Mehri Sirus<sup>4</sup>

## ABSTRACT

**Background:** Polycystic ovarian syndrome is one of the most common endocrine disorders with a prevalence of 5-10% in women. This syndrome is one of the major causes for menstrual disorders and is treated by medicational and non-medicational methods. This study aimed to define the effect of auriculotherapy on menstruation disorders in girls with polycystic ovarian syndrome.

**Materials and Methods:** This is a clinical trial conducted on 60 single girls aged 18-35 years with clinical, laboratory, and sonography signs. The subjects were randomly assigned to two groups of auriculotherapy and medication, which underwent treatment for 2 and 3 months, respectively. Clinical signs were investigated in three steps in both groups. Data were collected through observation, laboratory tests, and sonography, and were analyzed by SPSS version 15.

**Results:** In 60 subjects, Chi-square test showed a significant difference in menstruation disorders in both groups 1 month after the start of intervention ( $P = 0.001$ ); but 2 months after the start of intervention ( $P = 0.11$ ) and immediately after the end of the intervention ( $P = 0.16$ ), the difference was not significant. Three months after the end of the intervention, this variable showed a significant difference ( $P = 0.02$ ).

**Conclusions:** Medicational treatment and auriculotherapy are both effective on menstruation disorders, but auriculotherapy is more effective on reduction of menstruation disorders, compared to medicational therapy.

**Key words:** Auricular acupuncture, Iran, menstruation disorders, polycystic ovarian syndrome

## INTRODUCTION

Polycystic ovarian syndrome is one of the most common endocrine disorders among women.<sup>[1]</sup> Its prevalence is 5-10% at fertility age.<sup>[2-5]</sup> Ghanbari, in his study conducted in 2010, focused on the prevalence of polycystic ovarian syndrome among women at fertility age and reported its prevalence as 7% in Isfahan, Iran based on NIH (National Institutes of Health) scale, 15.2% based on Rotterdam scale, and 7.92% based on AES (Androgen Excess Society).<sup>[6]</sup> The signs of this disorder are polycystic ovaries on sonography, disorders

in ovulation, and irregular menstruation cycles in the form of amenorrhea. Its other signs include clinical hyperandrogenism in which high levels of androgens can lead to occurrence of some changes in appearance like hirsutism and adulthood acne or acute acne in adolescence, and alopecia with a male pattern.<sup>[7-9]</sup> Almost 50% of the patients develop hirsutism and 30-50% of them are obese.<sup>[2,3,10]</sup> One of the important and worrying complications of this syndrome is infertility.

Oligoovulation occurs among women with polycystic ovarian syndrome, while most of these women who have ovulation problem like to have children and undergo ovulation stimulation treatment.<sup>[11]</sup> Other complications of this disease are: uterine bleeding functional disorder, endometrial cancer, obesity, type two diabetes, and dyslipidemia,<sup>[12]</sup> Hypertension, an increase in cardiovascular pathogens,<sup>[13]</sup> neural disorders,<sup>[14,15]</sup> progression of depression and psychological signs, and an increase in neural stimulation and anorexia.<sup>[11]</sup> Various medicational and non-medicational methods are used to manage this disease. Among the common medicational treatments is use of combined tablets to suppress testosterone production by the ovary. Consumption of these tablets leads to weight gain in some women, which can result in more severe signs

<sup>1</sup>Department of Midwifery, Nursing and Midwifery Care Research Center, School of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan, Iran, <sup>2</sup>Student, School of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan, Iran, <sup>3</sup>Department of Gynecologist, Academic Member of Isfahan University of Medical Sciences, Isfahan, Iran, <sup>4</sup>Department of Sonographer and Radiologist, Academic Member of Isfahan University of Medical Sciences, Isfahan, Iran

**Address for correspondence:** Ms. Mahboubeh Valiani, Nursing and Midwifery Care Research Center, School of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan, Iran. E-mail: valiani@nm.mui.ac.ir

Submitted: 05-Nov-13; Accepted: 22-Apr-14

in the long term.<sup>[16,17]</sup> Metformin, medroxyprogesterone, and the cyproterone compounds cyproterone acetate and spironolactone are among the other medications used to treat this disease. Although these treatments are effective in reduction of the signs and complications of this disorder, they have side effects and should be consumed for a long time. On the other hand, there is a possibility of the disease signs relapsing on stopping the medications. Another disadvantage of the medication method is the high cost of these medications which is a financial burden to the families and demands more treatment budget in a country.<sup>[18]</sup>

In addition to the existing medication treatment methods, complementary therapies like reflexology,<sup>[18]</sup> acupressure,<sup>[19]</sup> and acupuncture<sup>[20,21]</sup> can be helpful in treating polycystic ovarian syndrome.<sup>[18]</sup> Clinical and experimental evidences show that acupuncture can be a proper replacement or complementary treatment for medication stimulation of ovaries in women with polycystic ovarian syndrome.<sup>[18-21]</sup> Acupuncture is also effective on regulation of internal systems,<sup>[22-24]</sup> including sympathetic nervous system, endocrine and glandular, and nervous systems.<sup>[22-24]</sup> Acupuncture refers to usage of needles to stimulate and activate energy canals existing all over the body. It can be administrated in the whole body or on ears which is called auriculotherapy.<sup>[25]</sup> Research shows that stimulation of the acupoints associated with polycystic ovarian syndrome through acupuncture leads to the patients' recovery and stimulation of these points through auriculotherapy, which is a branch of acupuncture, may yield the same effects. In fact, auriculotherapy refers to the stimulation of auricles (external ears) to diagnose and treat diseases and to preserve the health of different organs of the body. The difference is that in auriculotherapy, electric and seed method can be used to stimulate the points instead of needles, which is a rather invasive method. Its other advantages are that the patients need not require expose their body, and reflexive points in the auricles are used for treatment, when there are existing wounds, injuries, bandages, edema, or pain in the patients' body.<sup>[24]</sup>

This study aimed to investigate the effect of auriculotherapy on menstrual irregularities of single girls, aged 18-35 years, with polycystic ovarian syndrome. No study has been conducted on the effect of auriculotherapy on polycystic ovarian syndrome so far. Also, no study has been conducted in Iran on the effect of non-medication methods on this disease. With regard to the high prevalence of this disease in Iran, especially Isfahan, as well as patients' concerns about its clinical signs and complications and their reluctance toward medication methods, the researcher decided to investigate the effect of one of the non-medication

methods (auriculotherapy) on polycystic ovarian syndrome and compare that with medication methods.

## MATERIALS AND METHODS

This is a two-group three-stage clinical trial conducted on 60 single girls aged 18-35 and referring to private health centers in Isfahan, Iran during 2012-2013.

The subjects were randomly assigned to two groups ( $n = 30$ ) of auriculotherapy and medication. The girls meeting the inclusion criteria (no systemic diseases, endocrine, or nervous diseases; not taking special medication; suffering from polycystic ovarian syndrome based on Rotterdam scale; no addiction; no hyperprolactinemia; and having at least one intact ear) were enrolled in the study.

Exclusion criteria were having medication treatments during auriculotherapy treatment, willing to terminate the medication in the medication group, not referring for two sessions to complete the treatment, and taking any hormonal and psychotropic medication. The subjects were randomly given odd and even numbers (1-60). The even numbers were assigned to auriculotherapy group and the odd numbers to medication group. Hormonal test and sonography were requested for the eligible clients to confirm the diagnosis of polycystic ovarian syndrome based on Rotterdam scale (if out of three scales of clinical signs, laboratory tests, and sonography, two showed the existence of the syndrome, it confirmed the diagnosis). After selection of the subjects, they were examined and underwent counseling. Their demographic characteristics were recorded and they were asked to tick the checklist. The following menstrual irregularities were considered: Oligomenorrhea (menstruation cycle interval  $>35$  days), amenorrhea (no menstruation for three straight cycles or for 6 months), and polymenorrhea (menstruation cycle interval  $<21$  days), which were investigated in five stages of before the start of treatment, 1 and 2 months after intervention, immediately after the end of intervention, and 3 months after the end of intervention.

The subjects in the medication group, based on a gynecologist's prescription, received metformin, cyproterone compounds, or oral contraceptives from the first day of their menstruation to the fifth day for 21 straight nights, then rested for 7 days, and received the next pack of medication for three cycles of menstruation. In this way, they were sequentially treated by three packs of tablets. In the auriculotherapy treatment group, the subjects received auriculotherapy every other day from the end of their period for 10 days in each cycle and for two straight cycles

(20 auriculotherapy sessions). After auriculotherapy, seeds were used in the related points on the ear, which were capable of remaining on the points for 3 days.

The patients were recommended to press the seeds every 2 h (if needed, they were reminded through phone calls). If the patient suffered from amenorrhea, she underwent auriculotherapy for 10 days every other day. If the subject's period started during this time, the auriculotherapy treatment sessions were completed after the end of bleeding. Before conducting the present study, approval was obtained from the ethics committee of Isfahan University of Medical Sciences and a written consent was obtained from the subjects to enter the study. Joining the research was optional for the subjects. Data were analyzed by descriptive statistical tests, and *t*-test, Mann-Whitney, and Chi-square tests through SPSS 15.

## RESULTS

The present study was conducted on 60 single girls aged 18-35 years. Mean (SD) age of the subjects in auriculotherapy and medication groups were 23 (31) and 24.1 (4.4) years, respectively. Independent *t*-test showed no significant difference in subjects' age in the two groups ( $P = 0.2$ ,  $t = 1.4$ ). Most of the subjects were university students<sup>[27]</sup> subjects (90%) and 21 subjects (70%) in auriculotherapy and medication groups, respectively. In each group, three subjects (10%) were employees. The number of homemakers in the medication group was four (13.3%) and two subjects (6.7%) had other occupations. Chi-square test showed no significant difference in the frequency distribution of occupation

in the two groups of auriculotherapy and medication ( $P = 0.08$ ,  $k^2 = 6.75$ ). Level of education was another variable in the present study whose statistical analysis results have been presented in Table 1.

Mann-Whitney test showed no significant difference in the frequency distribution of education in the two groups ( $P = 0.33$ ,  $Z = 0.962$ ). The obtained results of menstrual irregularities in both groups have been presented in Table 2. Chi-square test showed no significant difference in menstrual irregularities in each of the two groups 1 month after intervention ( $P = 0.56$ ), while the level of menstrual irregularities in both groups showed a significant difference 2 months after intervention ( $P = 0.001$ ). Nevertheless, this test showed no significant difference in the level of menstrual irregularities 2 months after intervention ( $P = 0.11$ ) and immediately after intervention ( $P = 0.16$ ). The level of menstrual irregularities in the two groups of auriculotherapy and medication showed a significant difference 3 months after intervention ( $P = 0.02$ ) such that they were less in auriculotherapy group.

**Table 1: Frequency distribution of subjects' education in the two groups of auriculotherapy and medication**

Education	Auriculotherapy		Medication	
	No.	%	No.	%
Middle school and high school	3	10	7	23
Diploma and associate degree	19	63.3	16	53.3
Master's degree and higher	8	26.7	7	23.3
Total	30		30	

**Table 2: Frequency distribution of menstrual irregularities before intervention, 1 month after intervention, 2 months after intervention, 3 months after intervention, and 3 months after the end of intervention in auriculotherapy and medication groups**

Menstrual irregularities (%)	None	Polymenorrhea	Oligomenorrhea	Amenorrhea	Polymenorrhea and amenorrhea
Before intervention					
Auriculotherapy	10	13.3	43.3	13.3	20
Medication	6.7	20	53.3	3.3	16.7
One month after intervention					
Auriculotherapy	56.7	0	30	13.3	0
Medication	66.7	3.3	26.7	3.3	0
Two months after intervention					
Auriculotherapy	80	0	10	10	0
Medication	90	10	0	0	0
Three months after intervention					
Auriculotherapy	73.3	3.3	16.7	6.7	0
Medication	90	0	10	0	0
Three months after the end of intervention					
Auriculotherapy	63.3	6.7	23.3	6.7	0
Medication	33.3	20	46.7	0	0

## DISCUSSION

This study aimed to investigate the effects of auriculotherapy and medication on menstrual irregularities of single girls of age 18-35 years. The obtained results from 60 single girls with polycystic ovarian syndrome showed that auriculotherapy caused a greater decrease in menstrual irregularities, compared to medication.

Menstrual irregularities occur due to constant secretion of estrogen from the uterus and lack of progesterone production.<sup>[26]</sup> Auriculotherapy can be effective on these irregularities through regulating the levels of hormones and neurotransmitters in the body and brain.<sup>[24]</sup> Another factor that leads to menstrual irregularities is stress, as it causes a high production of prolactin and cortisol which leads to irregular ovulation, and has a direct effect on the production of sexual hormones of estrogen and progesterone, which results in menstruation irregularities.<sup>[24]</sup> Another effect of auriculotherapy is greater reduction of stress and elevation of satisfaction among the subjects attending the study, compared to medication.<sup>[27]</sup> High level of satisfaction participants may be due to reduction of stress among the subjects, as stress management can modify menstruation irregularities. As observed in the results, menstrual irregularities in the auriculotherapy group showed a better reduction 3 months after the intervention, compared to the medication group. It can be concluded that a uriculotherapy has a more Long-term efficacy, compared to medication.

Medicational methods treat the patients through their attachment to the receptors, and therefore, the effect of medication ceases on termination of consumption. Due to the above-mentioned effects and advantages, auriculotherapy can replace medication in treating menstruation irregularities caused by polycystic ovarian syndrome. Jedel *et al.* showed that acupuncture is accompanied with a reduction in androgens and improvement of women's menstruation regularity.<sup>[20]</sup> Pastore *et al.* concluded that acupuncture could reduce menstrual irregularities through modification of luteinizing hormone (LH) and follicle stimulating hormone (FSH) levels.<sup>[21]</sup> Our obtained results are consistent with the above-mentioned studies. As observed in our obtained results, medication was effective on menstruation irregularities, but auriculotherapy had a better effect in reducing the irregularities.

As the effect of medication has been proved by the other studies,<sup>[12,29,32]</sup> and the present study revealed that auriculotherapy is even more effective than medication, it can be a good replacement for medication. Lack of a control group was among the limitations of the study.

## CONCLUSION

Due to the effect of auriculotherapy on polycystic ovarian syndrome, this technique, which is a branch of acupuncture and is even more advantageous, can be suggested as a strategy to treat this syndrome.

Auriculotherapy leads to modification of menstrual irregularities and is applicable in all public treatment centers by medical and paramedical staff, including midwives. It reduces the consumption of hormonal medication and their unwanted side effects. On the other hand, medication requires long-term consumption. As observed in the present study, the signs of the disease relapse are shown on medication termination while auriculotherapy has a more long-lasting effect, which can be seen even up to 3 months after termination of the treatment. To conclude, researchers suggest conducting further studies on the effect of auriculotherapy on polycystic ovarian syndrome and comparing this method with other non-medicational methods.

## ACKNOWLEDGMENTS

This article was derived from a master thesis of name of student Imaneh khaki with project number 391314, Isfahan University of Medical Sciences, Isfahan, Iran, (IRCT2013O91614682N1). The researchers greatly appreciate the vice-chancellery for research of Nursing and Midwifery School of Isfahan University of Medical Sciences, as well as all the students who cooperated in this research.

## REFERENCES

1. Gibbs RS. Danforth's obstetrics and gynecology. In: Mosavi J, editor. 10<sup>th</sup> ed. Sobhan; Disorders of hyperandrogenism; 2008. p. 410.
2. Berek JS. Endocrine disorders. Novak's Gynecology. 14<sup>th</sup> ed. In: Ghazi Jahani B. Berek and: Artin Medicine. Tehran: Tabriz Glban; 2012. p. 346,55-70.
3. Goodwin TM, Laufer N. Poly cystic ovarian syndrome\_ Hirsutism- Amenorrhea. In: DeCherney A; editor. Current Diagnosis and Treatment Obstetrics and Gynecology. 10<sup>th</sup> ed. New York: McGraw-Hill Professional; 2007.
4. HajiShafieiha M. Poly cystic ovarian syndrome. Causes and treatment of chronic anovulation 1<sup>st</sup> ed. Urmia: Shahed Isargaran; 1382. page: 7780-964-978 -2574.
5. Crosignani PG, Nicolosi AE. Poly cystic ovarian syndrome: Heritability and Heterogeneity. Hum Reprod Update 2001;7:3-7.
6. Kistner RW, Ryan KJ, Berkowitz RS, Barbieri RL. Kistner's gynecology: Principles and practice. Kenneth J. Ryan. 2008. ISBN-10: 0815174799 ISBN-13: 978-0815174790.
7. Stener- victoren E, Waldenstro U, Gnfor U, Landeberg T, Lindstedt G, Janson PO. Effects of electro-acupuncture on anovulation in women with polycystic ovary syndrome. Acta Obstet Gynecol Scand 2000;79:180-8.

8. Ziaie A, Yazdi Z, Abedini A. Effects of Pioglitazone and Metformin on Insulin Resistance Reduction in Polycystic Ovary Syndrome: A comparative study. *J Isfahan Med Sch* 2012;29.
9. Tsilchorozidou T, Overton C, Conway GS. The pathophysiology of polycystic ovary syndrome. *Clin Endocrinol (Oxf)* 2004;60:1-17.
10. Ehrmann D, Barner RB, Rosenfield RH. Hyperandrogenism, Hirsutism and polycystic ovary syndrome. In: Leslie J, De Groot J, Jameson L, editors. *Endocrinology*. Vol. 3. USA: W.B. Saunders Company; 2001. p. 2122-37.
11. Aspyraf N, Frtys M. *Clinical Endocrinology and Infertility Women Aspyraf*, translatinghazi. In: Jahani B, Mohajerani S, Fadaei A, editors. 7<sup>th</sup> ed. Tehran: Golban Medical Publications; 1392.
12. Salehpour SH, Shahverdi Z, Farahmand M, Roz Rokh M. Comparison of compound cyproterone-spironolactone and metformin on PCOS. Vol. 28. Iran: *Journal of Medical Council of Islamic Republic of Iran*; 1389. p. 377-87.
13. Barnard L, Ferriday D, Guenther N, Strauss B, Balen AH, Dye L. Quality of life and psychological well being in polycystic ovary syndrome. *Hum Reprod* 2007;22:2279-86.
14. Himelein MJ, Thatcher SS. Depression and body image among women with polycystic ovary syndrome. *J Health Psychol* 2006;11:613-25.
15. Pinhas-Hamiel O, Pilpel N, Carel C, Singer S. Clinical and laboratory characteristics of adolescents with both polycystic ovary disease and anorexia nervosa. *FertilSteril* 2006;85:1849-51.
16. Leeman L, Acharya U. The use of metformin in the management of polycystic ovary syndrome and associated anovulatory infertility: The current evidence. *J Obstet Gynaecol* 2009;29:467-72.
17. Chen BY. *Acupuncture Normalizes Dysfunction of Hypothalamic- Pituitary- Ovarian Axis*. *Acupunct Electrother Res* 1997;22:97-108. 1997 Copyright (c) 1997 Cognizant Communication Corp. Available from <http://www.ncbi.nlm.nih.gov/pubmed/9330669> [Last accessed on 1997 Jun 30]. PMID: 9330669 [PubMed-indexed for MEDLINE].
18. Changlong ZH, Guixiang L. Clinical Observation on the Treatment of Polycystic Ovary Syndrome with Reflexotherapy the Chinese Society of Preventive Medicin 1999-04; ISSN: 1004- 6569. CN: 11-3086/R. YP:1992. Available form: [http://www.cnki.com.cn/Journal\\_en/E-E056-SZBJ-1999-04.htm](http://www.cnki.com.cn/Journal_en/E-E056-SZBJ-1999-04.htm) [Last accessed on 1999 Apr 01].
19. Badawy A, Elnashar A. Treatment options for polycystic ovary syndrome. *Int J Womens Health* 2011;3:25-35. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3039006/> [Last accessed on 2011 Feb 08]. *Int J Womens Health*. 2011;3:25-35. Published online Feb 8, 2011. doi: 10.2147/IJWH.S11304.
20. Jedel E, Labrie F, Odexn A, Holm G, Nilsson L, Janson PO. Impact of electro-acupuncture and physical exercise on hyperandrogenism and oligo/amenorrhea in women with polycystic ovary syndrome: A randomized controlled trial. *Am J Physiol Endocrinol Metab* 2011;300:E37-45.
21. Pastore LM, Williams CD, Jenkins J, Patrie JT. True and Sham acupuncture produced similar frequency of ovulation and improved LH to FSH ratios in women with polycystic ovary syndrome. *J Clin Endocrinol Metab* 2011;96:3143-50.
22. Lim DC, Chen W, Cheng LN, Xue CC, Wong FW, O'Sullivan AJ, *et al.* Acupuncture for polycystic ovarian syndrome. *Cochrane Database Syst Rev* 2011;(8):CD007689.
23. Ismaili N. *acupuncture ear training*. Nadali. 4<sup>th</sup> ed. Mazandaran: Nadali; 1390. p. 13,27,37.
24. Oleson T. *Auriculotherapy manual*. Auriculotherapy manual Chinese and Western systems of ear acupuncture forward by raphaelnogier. 3<sup>rd</sup> illustrated. London: Churchill Livingstone; 2003. p. 2008.
25. Mehrabian F, Khani B, Kelishadi R, Ghanbari E. The prevalence of polycystic ovary syndrome in Iranian women based on different diagnostic criteria. *Endokrynol Pol* 2011;62:238-42.
26. McKee D. Treating facial acne in adolescents and young adults with auriculoacupuncture and auriculotherapy: A PILOT STUDY. *Med Acupunct* 2000;16. Available from: [http://www.medicalacupuncture.org/assets/images/journal\\_logo.gif](http://www.medicalacupuncture.org/assets/images/journal_logo.gif). [Last accessed on 2005 Jan 14].
27. Barsom SH, Mansfield PK, Koch PB, Gierach G, West SG. Association between psychological stress and menstrual cycle characteristics in perimenopausal women. *Womens Health Issues* 2004;4:235-4.29.
28. Sato KL, Rizzo GJ, Pavarini T, Paes da Silva M. Effectiveness of auriculotherapy for stress, based on experience of the therapist: A clinical trial. *Acta Paul Enferm* 2012;25:694-700.
29. Heshmati. Iranian culture generic drugs. 1378. Available from: <http://www.fa.wikipedia.org/wik> [Last accessed on 2009 Jul 20]. Creative Commons Attribution/Share-Alike.
30. Tavassoli F, Sharifian Attar J, Tavassoli S. Endocrine and metabolic effects of metformin versus Diane in women with polycystic ovary syndrome. *Iran J Obstet Gynecol Infertil* 2004;3.
31. Nazari T, Bayat R, Samiee H. Effect of Metformin on single girl with polycystic ovarian syndrome. *J Reprod Infertil* 2005;6:177-86.
32. Bafghi Tabatabai A, Mjybyan M. The menstrual cycle in polycystic ovary syndrome treated with metformin. *Journal of Rafsanjan University of Medical Sciences* 1382;2:137-42. Summer and Fall *Journal of Rafsanjan University of Medical Sciences* 1382;2:137-42. [http://journal.rums.ac.ir/browse.php?a\\_code=A-10-47-1&slc\\_lang=fa&sid=1](http://journal.rums.ac.ir/browse.php?a_code=A-10-47-1&slc_lang=fa&sid=1) [Last accessed on Summer-Fall 2003]. *Journal of Rafsanjan University of Medical Sciences Indexed by: Doaj, EBSCO, Google Scholar, Index Copernicus (2011 IC Value= 5.59), Iranmedex, ISC, Magiran, Open J Gate, Safety lit, SID.*

**How to site:** Valiani M, Khaki I, Shahshahan Z, Sirus M. Effect of auriculotherapy on menstrual irregularities in single girls with polycystic ovarian syndrome and aged 18-35 years in Isfahan in 2012. *Journal of Nursing and Midwifery Research* 2015;20:190-4.

**Source of Support:** Financial support from Isfahan University of Medical Sciences, 391314, Isfahan, Iran, **Conflict of Interest:** Nil.