

## THE EFFECTS OF HIRUDOTHERAPY AS A COMPLEMENTARY IN THE TREATMENT OF A PATIENT WITH POLYCYSTIC OVARY SYNDROME: A RARE CASE REPORT <sup>(1)</sup>

### POLİKİSTİK OVER SENDROMLU BİR HASTANIN TEDAVİSİNDE TAMAMLAYICI OLARAK HİRUDOTERAPİNİN ETKİLERİ: NADİR BİR OLGU SUNUMU

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**Öz: Giriş:** Üreme çağındaki kadınlar arasında en yaygın olarak görülen endokrin bozukluk, polikistik over sendromu (PKOS) olarak adlandırılır. PKOS, androjen ve insülin yüksekliği ve yağ dokudan aşırı seviyede adipokin salınımı ile oluşur. **Amaç:** Bu olgu sunumunda amaç, literatürde ilk vakalardan birisi olarak, hirudoterapi uygulamasının, üreme çağındaki kadınlarda çok sık görülen ve infertiliteye yol açabilen PKOS'un ve aknenin tedavisindeki olumlu etkisini göstermektir. **Yöntem:** Bir GETAT Uygulama Merkezine başvuran 28 yaşında, kadın hasta, anamnezinde infertilite nedeniyle tedavi görmekte olduğunu belirtti. Hasta, infertilite tedavisine tamamlayıcı olarak hirudoterapi uygulanması başvurusunda bulundu. Hasta öncelikle bilgilendirilmiş gönüllü olur formunu okuyup, imzaladı. Yapılan muayene ve tetkikler sonrasında hastaya hirudoterapi uygulanmasına karar verildi. Hirudoterapi için hastanın sağ ve sol inguinal bölgelerine üçer adet ve yüzünün sol tarafına bir adet olmak üzere toplam dört adet küçük boy (ağırlığı 0,5 gr civarında olan) sülük uygulandı. Uygulama sonrası, hastaya yapılan muayene ve tetkikler yenilendi. **Bulgular:** Sunulan olguda yapılan tek seans hirudoterapi uygulaması sonrasında, kan LH/FSH oranı ve prolaktin düzeyi azaldı. Overdeki kistlerde düzelme radyolojik olarak ultrason ile gösterildi. Hirudoterapi sonrasında fizik muayenede akne oluşumunda belirgin gerileme görüldü. **Sonuç:** Literatürde, PKOS hastalarında tedavide tamamlayıcı olarak hirudoterapi kullanımının olumlu etkilerini gösteren ilk olgulardan birisi olarak sunulan bu hastaya ait sonuçların özgün değeri yüksektir. Hirudoterapi uygulamasının PKOS üzerine muhtemel olumlu etkilerini göstermek için daha geniş vaka serilerine ve kontrollü çalışmalara ihtiyaç bulunmaktadır.

**Anahtar Kelimeler:** Hirudoterapi, Sülük, Infertilite, Biyokimya

**Abstract: Introduction:** The most common endocrine disorder among women in reproductive age is called polycystic ovary syndrome (PCOS). PCOS occurs with elevated levels of androgen and insulin, and excessive release of adipokines from adipose tissue. **Aim:** The purpose of this case report is to show the positive effect of hirudotherapy application, which is one of the first cases in the literature, in the treatment of PCOS and acne which is very common in women of reproductive age. **Method:** A 28-year-old female patient who applied to a GETAT Practice Center stated that she was being treated for infertility in her anamnesis. The patient applied for hirudotherapy as a complement to infertility treatment. The patient first read and signed the informed volunteer consent form. After the examinations and examinations, it was decided to apply hirudotherapy to the patient. For hirudotherapy, a total of four small-sized leeches (weight around 0.5 g) were applied to the right and left inguinal areas of the patient and one on the left side of the face. After the application, the examinations and analyses performed on the patient were renewed. **Results:** After the single session of hirudotherapy in the presented case, blood LH / FSH ratio and prolactin level decreased. Improvement in ovarian cysts was demonstrated radiologically by ultrasound. After hirudotherapy, there was a marked decrease in acne formation on physical examination. **Conclusion:** The results of this patient, presented as one of the first cases showing the positive effects of hirudotherapy as a complement to treatment in PCOS patients, have a high value in the literature. Larger case series and controlled studies are needed to demonstrate the possible positive effects of hirudotherapy applications on PCOS.

**Keywords:** Hirudotherapy, Leech, Infertility, Biochemistry

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## INTRODUCTION

The most common endocrine disorder among women in reproductive age is called polycystic ovary syndrome (PCOS). PCOS occurs with increased androgen and insulin levels and excessive release of adipokines by adipose tissue. Insulin resistance, obesity, diabetes, metabolic syndrome and cardiovascular diseases often accompany the clinical picture of patients with PCOS. PCOS also has an important place among the causes of infertility among women. Significant increases in luteinizing hormone (LH)/follicle stimulating hormone (FSH) ratio are observed in PCOS. Lowering LH level below FSH level can be regarded as an important goal in the treatment and follow-up of the patients. Acne and menstrual irregularities may occur due to high level of androgen as the LH/FSH ratio increases (Macut et al., 2017: 163-170; Savas and Gultekin, 2017: 116-125; Ehrmann, 2005; 1223-1236; Lewis, 2001: 1-20). World Health Organization defines traditional medicine as a combination of information and practices specific to different cultures that can or cannot be explained. Hirudotherapy is a traditional method performed with medical leeches. Hirudotherapy has been and is still used by patients and healthcare staff for a long time. Republic of Turkey Ministry of Health published the Traditional and Complementary Medicine Regulation in the 27th of Oc-

tober 2014 to prevent these practices turning into a public health issue. According to this regulation, hirudotherapy practices can only be performed by certified physicians and dentists if it relates to their field. Various measures are taken to prevent possible side effects of hirudotherapy. Among these measures, it is important to select patients by examining the medical records and laboratory values of the person prior to the application. Thus, hirudotherapy cannot be performed on those who are allergic to the enzymes of leeches and those with any bleeding disorders according to their medical records. Hirudotherapy should also not be performed on patients who are on warfarin treatment which increases International Normalized Ratio (INR) values (Savas, 2020: 1-4). There are no studies that present hirudotherapy as a complementary method for the treatment of patients with PCOS in the literature. This case report aims to reveal the positive effect of hirudotherapy, one of the first cases in the literature, on the treatment of PCOS which is common among women in reproductive age and may cause infertility, and PCOS-related acne.

## CASE REPORT

The female patient who applied to the Alanya Education and Research Hospital Traditional and Complementary Medicine (TCM) Center primarily read and signed the informed voluntary consent form. Routine biochemi-



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cal examinations were made before and after hirudotherapy application. Ovaries were imaged with ultrasound. A total of four small-sized leeches (weight around 0.5 g) were applied to the right and left inguinal areas of the patient and one on the left side of the face for hirudotherapy. After the application, the area where the leech was separated was dressed and covered with a hard cotton patch. The application was terminated by recommending the patient to apply for control again after one week. Ethics committee approval was obtained from Alanya Alaaddin Keykubat University Faculty of Medicine Clinical Research Ethics Committee with the decision dated 17.01.2019 and numbered 1-25 and numbered 10354421-2019/1. A 28-year-old female patient who applied to the Alanya Education and Research Hospital TCM Center, was conceived once with IVF method and her pregnancy resulted in abortus. Her medical records showed that she was on treatment for infertility. The patient applied for hirudotherapy as a complementary for her infertility treatment. Laboratory tests

made before hirudotherapy were evaluated in the normal range. The researcher decided to perform hirudotherapy since there were no obstacles that can prevent hirudotherapy application such as allergy and bleeding predisposition. One session of hirudotherapy was performed on the patient. The laboratory values found in the measurement made from the blood taken during the hirudotherapy application of the patient are as follows: fasting serum glucose: 98 mg/dL, glycosylated hemoglobin % (HbA1C): 5.5, Urea: 16 mg/dL, Creatinine: 0.69 mg/dL, aspartate aminotransferase (AST): 22 U/L, alanine aminotransferase (ALT): 21 U/L, hemoglobin: 12.16 g/dL, leukocyte: 5.66 x 10<sup>3</sup>/uL, INR: 0.97, HBsAg: negative, Anti-HCV: negative, Anti-HIV: negative, thyroid stimulating hormone (TSH): 3.58 mIU/L, free T 4 (FT4): 0.76 mIU/L, Vitamin B 12: 620 pg/mL.

Laboratory values on female fertility hormone measurements, pelvic ultrasonography (USG) results and clinical data before and after treatment are presented in Table 1 comparatively.

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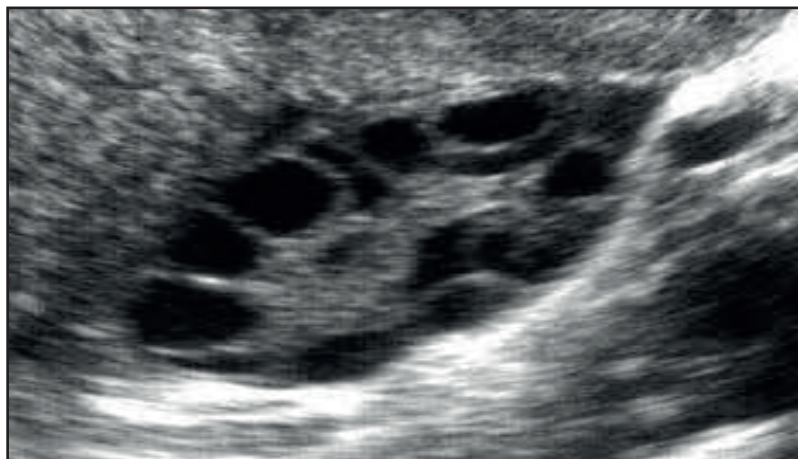
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**Table 1. Comparison of Clinical and Laboratory Values Before and After Hirudotherapy**

	Before Hirudotherapy	After Hirudotherapy
Prolactin (PRL)	13.86 ng/ml	9.15 ng/ml
Follicle stimulating hormone (FSH)	3.64 mIU/ml	7.34 mIU/ml
Luteinizing hormone (LH)	4.19 mIU/ml	6.67 mIU/ml
LH / FSH	1.15	0.91
Pelvic Ultrasonography	12 pieces, less than 8mm follicle (Polycystic ovary syndrome) It was shown in figure 1.	Overs are normal It was shown in figure 2.
Acne	On physical examination, marked acne formation was revealed. It was shown in figure 3.	On physical examination, acne was diminished and regressed. It was shown in figure 4.
Menstrual Cycle	Menstrual Cycle Oligomenorrhea	Regular menstrual cycle

**Figure 1. Pelvic USG Image Before Hirudotherapy**

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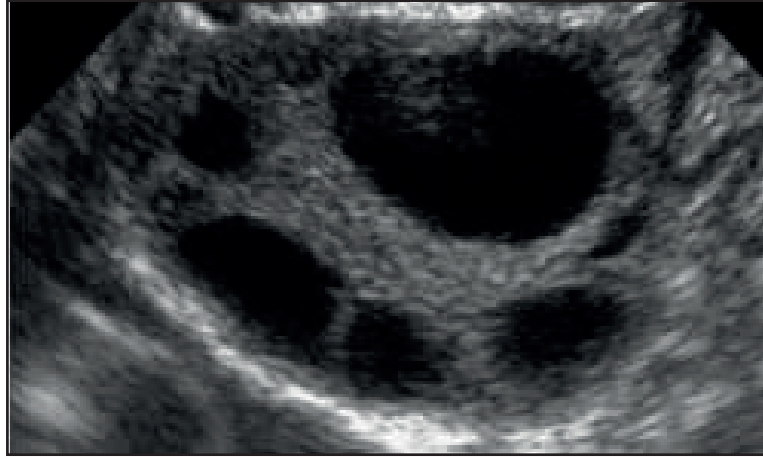
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**Explanation:** 12 pieces, less than 8mm follicle (Polycystic ovary syndrome).



**Figure 2. Pelvic USG Image After Hirudotherapy**

**Explanation:** Ovars are normal.



**Figure 3. Image of Acne Before Hirudotherapy**

**Explanation:** On physical examination, marked acne formation was revealed.

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**Figure 4. Image of Acne After Hirudotherapy**

**Explanation:** On physical examination, acne was diminished and regressed.

## DISCUSSION

Leeches were used as a complementary medicine method in ancient societies for centuries. Hirudotherapy, the use of which has decreased with the development of modern medicine, has recently started to be performed again in especially plastic surgery clinics to treat venous obstruction after surgery. The U.S Food and Drug Administration (FDA) allowed selling medical leech in pharmacies in 2004 (Zaidi et al., 2011: 59-65; Abdullah et al., 2012: 172-180). Hirudotherapy is a traditional method performed using medical leeches. Leeches take 1-2 ml of blood from the skin on the area where it is applied and release some enzymes into the host to whom

it adheres. Each of these enzymes has different effects while hirudin has anti-coagulant effect and calin has the effect of inhibiting platelet functions. Table 2 shows the various secretions of leeches and the effects of these secretions. It may take approximately 60-120 minutes for the leech to stick, take blood and release secretions to the host from the place where it draws blood. This duration may change based on the person, area, and blood build up status in the related area. After application, the leech naturally leaves where it stuck without outside intervention. The area where the leech is separated is dressed and covered with hard cotton or a sponge. The covered area cannot be opened for at least 24 hours and no contact with water on the application area is allowed during this period. The leech that stops taking blood is considered

medical waste and disposed. Thus, the leech is applied in only one patient and the spread of infectious diseases is prevented by applying different leeches in each patient (Das, 2014: 33-45). The blood LH/FSH ratio and prolactin level in the presented case report

decreased after one session of hirudotherapy. Improvement in ovarian cysts was demonstrated radiologically by ultrasound. There was a significant decrease in acne formation on physical examination after hirudotherapy.

**Table 2. Various Secretions of Leeches and Their Effects**

Effect	Bioactive Substance
Analgesic and Anti-Inflammatory	Anti-stasin, Hiruastasin, Ghilantens, Eglin, LDTI, Complemet C1inh. , Guamerin and Piguamerin, Carboxypeptidase inh. , Bdelins, Bdellaastasin.
Extracellular Matrix Destruction	Hyaluronidase and Collagenase
Increase in Blood Flow	Acetylcholine, Histamine-like molecule
Blocking Platelet Functions	Saratin, Caline, Apyrase, Decorsin
Anti-Coagulant	Hirudin, Gelin, Factor Xa inh., Destabilaz, New leech protein-1, whitide and whitmanin
Anti-Bacterial	Destabilase, Chloromycetyn, Theromacin, Theromyzin and Peptide B

PCOS is a common endocrine disorder among fertile women. The case report revealed that hirudotherapy had a significant healing effect on PCOS symptoms, laboratory findings and the appearance of acne on the face after one session of hirudotherapy performed on the patient who consulted to the hospital with infertility and PCOS diagnoses. The LH/FSH ratio decreased after hirudotherapy. In conclusion, hirudotherapy can be regarded as an effective complementary option for the treatment of the patients with PCOS. The results of this patient that were presented as one of the first cases showing the positive effects of hirudotherapy as a complementary to treatment in

patients with PCOS has a high value in the literature. Larger case series and controlled studies should be conducted to demonstrate the possible positive effects of hirudotherapy on PCOS.

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