

Bölüm 100

KADIN İNFERTİLİTESİNE YAKLAŞIM

Çağdaş DEMİROĞLU¹

GİRİŞ

İnfertilitenin tanımı 35 yaşının altındaki kadınlarda korunmasız bir yıl cinsel ilişkiye rağmen, 35 yaşın üstündeki kadınlarda ise korunmasız cinsel ilişkiye rağmen 6 ay gebe kalamama durumu olarak tanımlanmaktadır. Ancak düzensiz adetleri olan yada bilinen risk faktörleri olan kadınlarda örneğin endometriosisi olan kadınlarda, PID öyküsü olan kadınlarda yada ürogenital trakt malformasyonu olan kadınlarda bu süre daha erkene çekilebilir.

İlk değerlendirme bu konuya ilgili ve deneyimi olan bir kadın doğum uzmanı tarafından yapılabilir. Pe çok kadın doğum uzmanı bu tip hastalar konusunda yeterli ilgi ve deneyime sahip değildir. Bu tip hastalar genellikle alanında uzmanlaşmış reproduktif endokrinologlara sıklıkla refere edilirler.

İnfertilite nedeniyle başvuran hastalarda bir çok test yapılabilmektedir. bu testlerin bir kısmı kanıt bazlı çalışmalarla desteklenmiş testler olup bazı testler ise geleneksel olarak kalmıştır. Bu bölümde kadın infertilitesinin etyolojisine, tanısına ve tedavisine başlıca değinilmektedir.

İLK YAKLAŞIM

Fertilite değerlendirilirken partnerlerin her ikisinde infertilite faktörleri açısından değerlendirilmelidir. Çiftin, infertilitesine katkıda bulunan birçok farklı faktöre sahip olabileceğini unutmamak

önemlidir; bu nedenle, eğer varsa, infertilitenin en yaygın nedenlerini saptamak için tam bir ilk tanı değerlendirmesi yapılmalıdır. Her iki partnerin değerlendirmesine aynı anda başlanabilir (1). Bu tip hastaların tanı aşaması etiyolojik araştırma aşaması ve tedavi aşaması çoğu çift için stresli bir dönemdir (2). Klinisyen çiftlerin depresyona, anksiyeteye yol açabilecek emosyonel durumlarını yok saymamalıdır.

Hikaye ve klinik değerlendirme

Hikaye ve fizik muayene bulguları kısırlığın nedenini ortaya koyabilir ve bu nedenle tanısız değerlendirmenin kolaylaşmasına ve belirli noktalara odaklanarak hızlıca sonuca gidilmesine olanak sağlamaktadır.

Hikaye – Hikayedeki en önemli noktalar şunlardır;

- İnfertilitenin süresi ve daha önce uygulanan tanı ve tedavi yöntemleri
- Menstrüel öykü (siklus uzunluğu ve karakteristiği). Menstrüel öykü hastanın ovulasyon durumunu bize göstermektedir. Ayrıca mens sırasında yada mens aralarında ağrıları olması dismenore şikayetleri bize endometriosisi düşündürülebilir.
- Medikal, cerrahi ve jinekolojik öykü (seksüel geçişli hastalıklar dahil pelvik inflamatuvar hastalık veya anormal smeara bağlı tedavi alması da bu durumlara dahildir). En azından, sistemlerin gözden geçirilmesi hastanın tiroid

¹ Uzman Doktor, Şanlıurfa E.A.H KHD ABD, cagdasdemiroglu@gmail.com

mamış birçok alan bulunan bu konuda daha çok çalışmaya ve daha çok özenen ihtiyaç mevcuttur.

Anahtar kelimeler: Kadın fertilitesi, İnfertilite, İVf Tedavisi

Kaynaklar

1. Practice Committee of American Society for Reproductive Medicine. Diagnostic evaluation of the infertile female: a committee opinion. *Fertil Steril* 2012; 98:302.
2. Cousineau TM, Domar AD. Psychological impact of infertility. *Best Pract Res Clin Obstet Gynaecol* 2007; 21:293.
3. Lass A. The fertility potential of women with a single ovary. *Hum Reprod Update* 1999; 5:546.
4. World Health Organization, WHO laboratory manual for the examination of human semen and sperm-cervical mucus interaction. 4th edition. Cambridge University Press, Cambridge, UK, 1999.
5. Wathen NC, Perry L, Lilford RJ, Chard T. Interpretation of single progesterone measurement in diagnosis of anovulation and defective luteal phase: observations on analysis of the normal range. *Br Med J (Clin Res Ed)* 1984; 288:7.
6. Ecochard R, Boehringer H, Rabilloud M, Marret H. Chronological aspects of ultrasonic, hormonal, and other indirect indices of ovulation. *BJOG* 2001; 108:822.
7. Practice Committee of the American Society for Reproductive Medicine. Testing and interpreting measures of ovarian reserve: a committee opinion. *Fertil Steril* 2015; 103:e9.
8. Committee on Gynecologic Practice. Committee opinion no. 618: Ovarian reserve testing. *Obstet Gynecol* 2015; 125:268. Reaffirmed 2017.
9. Abdalla H, Thum MY. An elevated basal FSH reflects a quantitative rather than qualitative decline of the ovarian reserve. *Hum Reprod* 2004; 19:893.
10. Jain T, Soules MR, Collins JA. Comparison of basal follicle-stimulating hormone versus the clomiphene citrate challenge test for ovarian reserve screening. *Fertil Steril* 2004; 82:180.
11. Hendriks DJ, Mol BW, Bancsi LF, et al. The clomiphene citrate challenge test for the prediction of poor ovarian response and nonpregnancy in patients undergoing in vitro fertilization: a systematic review. *Fertil Steril* 2006; 86:807.
12. Broekmans FJ, Kwee J, Hendriks DJ, et al. A systematic review of tests predicting ovarian reserve and IVF outcome. *Hum Reprod Update* 2006; 12:685.
13. Licciardi FL, Liu HC, Rosenwaks Z. Day 3 estradiol serum concentrations as prognosticators of ovarian stimulation response and pregnancy outcome in patients undergoing in vitro fertilization. *Fertil Steril* 1995; 64:991.
14. Smotrich DB, Widra EA, Gindoff PR, et al. Prognostic value of day 3 estradiol on in vitro fertilization outcome. *Fertil Steril* 1995; 64:1136.
15. Souter I, Dimitriadis I, Baltagi LM, et al. Elevated day 3 follicle-stimulating hormone in younger women: is gonadotropin stimulation/intrauterine insemination a good option? *Am J Obstet Gynecol* 2014; 211:62.e1.
16. Dewailly D, Andersen CY, Balen A, et al. The physiology and clinical utility of anti-Müllerian hormone in women. *Hum Reprod Update* 2014; 20:370.
17. Seifer DB, Baker VL, Leader B. Age-specific serum anti-Müllerian hormone values for 17,120 women presenting to fertility centers within the United States. *Fertil Steril* 2011; 95:747.
18. de Vet A, Laven JS, de Jong FH, et al. Antimüllerian hormone serum levels: a putative marker for ovarian aging. *Fertil Steril* 2002; 77:357.
19. Nardo LG, Gelbaya TA, Wilkinson H, et al. Circulating basal anti-Müllerian hormone levels as predictor of ovarian response in women undergoing ovarian stimulation for in vitro fertilization. *Fertil Steril* 2009; 92:1586.
20. Anckaert E, Smitz J, Schiettecatte J, et al. The value of anti-Müllerian hormone measurement in the long GnRH agonist protocol: association with ovarian response and gonadotrophin-dose adjustments. *Hum Reprod* 2012; 27:1829.
21. Broer SL, Dölleman M, Opmeer BC, et al. AMH and AFC as predictors of excessive response in controlled ovarian hyperstimulation: a meta-analysis. *Hum Reprod Update* 2011; 17:46.
22. Iliodromiti S, Kelsey TW, Wu O, et al. The predictive accuracy of anti-Müllerian hormone for live birth after assisted conception: a systematic review and meta-analysis of the literature. *Hum Reprod Update* 2014; 20:560.
23. Steiner AZ, Pritchard D, Stanczyk FZ, et al. Association Between Biomarkers of Ovarian Reserve and Infertility Among Older Women of Reproductive Age. *JAMA* 2017; 318:1367.
24. Lutchman Singh K, Muttukrishna S, Stein RC, et al. Predictors of ovarian reserve in young women with breast cancer. *Br J Cancer* 2007; 96:1808.
25. ACOG Committee Opinion No. 773: The Use of Anti-Müllerian Hormone in Women Not Seeking Fertility Care. *Obstet Gynecol* 2019; 133:e274.
26. Gnoth C, Schuring AN, Friol K, et al. Relevance of anti-Müllerian hormone measurement in a routine IVF program. *Hum Reprod* 2008; 23:1359.
27. van Rooij IA, Broekmans FJ, Scheffer GJ, et al. Serum antimüllerian hormone levels best reflect the reproductive decline with age in normal women with proven fertility: a longitudinal study. *Fertil Steril* 2005; 83:979.
28. Steiner AZ, Herring AH, Kesner JS, et al. Antimüllerian hormone as a predictor of natural fecundability in women aged 30-42 years. *Obstet Gynecol* 2011; 117:798.
29. Almog B, Shehata F, Suissa S, et al. Age-related normograms of serum antimüllerian hormone levels in a population of infertile women: a multicenter study. *Fertil Steril* 2011; 95:2359.
30. Weghofer A, Dietrich W, Barad DH, Gleicher N. Live birth chances in women with extremely low-serum anti-Müllerian hormone levels. *Hum Reprod* 2011; 26:1905.
31. Nelson SM, Iliodromiti S, Fleming R, et al. Reference range for the antimüllerian hormone Generation II assay: a population study of 10,984 women, with comparison to the established Diagnostics Systems Laboratory nomogram. *Fertil Steril* 2014; 101:523.

32. Rustamov O, Smith A, Roberts SA, et al. Anti-Mullerian hormone: poor assay reproducibility in a large cohort of subjects suggests sample instability. *Hum Reprod* 2012; 27:3085.
33. Su HI, Sammel MD, Homer MV, et al. Comparability of antimüllerian hormone levels among commercially available immunoassays. *Fertil Steril* 2014; 101:1766.
34. Toner JP, Seifer DB. Why we may abandon basal follicle-stimulating hormone testing: a sea change in determining ovarian reserve using antimüllerian hormone. *Fertil Steril* 2013; 99:1825.
35. Dorgan JF, Spittle CS, Egleston BL, et al. Assay reproducibility and within-person variation of Müllerian inhibiting substance. *Fertil Steril* 2010; 94:301.
36. Fleming, R, Deshpande, N, Traynor, I, Yates, RW. Dynamics of FSH-induced follicular growth in subfertile women. *Hum Reprod* 2006.
37. Visser JA, de Jong FH, Laven JS, Themmen AP. Anti-Müllerian hormone: a new marker for ovarian function. *Reproduction* 2006; 131:1.
38. Johnson NP, Bagrie EM, Coomarasamy A, et al. Ovarian reserve tests for predicting fertility outcomes for assisted reproductive technology: the International Systematic Collaboration of Ovarian Reserve Evaluation protocol for a systematic review of ovarian reserve test accuracy. *BJOG* 2006; 113:1472.
39. Luttjeboer F, Harada T, Hughes E, et al. Tubal flushing for subfertility. *Cochrane Database Syst Rev* 2007; :CD003718.
40. Swart P, Mol BW, van der Veen F, et al. The accuracy of hysterosalpingography in the diagnosis of tubal pathology: a meta-analysis. *Fertil Steril* 1995; 64:486.
41. Papaioannou S, Bourdrez P, Varma R, et al. Tubal evaluation in the investigation of subfertility: a structured comparison of tests. *BJOG* 2004; 111:1313.
42. Saunders RD, Shwayder JM, Nakajima ST. Current methods of tubal patency assessment. *Fertil Steril* 2011; 95:2171.
43. Soares SR, Barbosa dos Reis MM, Camargos AF. Diagnostic accuracy of sonohysterography, transvaginal sonography, and hysterosalpingography in patients with uterine cavity diseases. *Fertil Steril* 2000; 73:406.
44. Seshadri S, El-Toukhy T, Douiri A, et al. Diagnostic accuracy of saline infusion sonography in the evaluation of uterine cavity abnormalities prior to assisted reproductive techniques: a systematic review and meta-analyses. *Hum Reprod Update* 2015; 21:262.
45. Smit JG, Kasius JC, Eijkemans MJ, et al. Hysteroscopy before in-vitro fertilisation (inSIGHT): a multicentre, randomised controlled trial. *Lancet* 2016; 387:2622.
46. Smith S, Pfeifer SM, Collins JA. Diagnosis and management of female infertility. *JAMA* 2003; 290:1767.
47. Tanahatoo SJ, Hompes PG, Lambalk CB. Investigation of the infertile couple: should diagnostic laparoscopy be performed in the infertility work up programme in patients undergoing intrauterine insemination? *Hum Reprod* 2003; 18:8.
48. Balasch J. Investigation of the infertile couple: investigation of the infertile couple in the era of assisted reproductive technology: a time for reappraisal. *Hum Reprod* 2000; 15:2251.
49. Luttjeboer FY, Verhoeve HR, van Dessel HJ, et al. The value of medical history taking as risk indicator for tuboperitoneal pathology: a systematic review. *BJOG* 2009; 116:612.
50. Perquin DA, Dörr PJ, de Craen AJ, Helmerhorst FM. Routine use of hysterosalpingography prior to laparoscopy in the fertility workup: a multicentre randomized controlled trial. *Hum Reprod* 2006; 21:1227.
51. Oei SG, Helmerhorst FM, Keirse MJ. When is the post-coital test normal? A critical appraisal. *Hum Reprod* 1995; 10:1711.
52. Practice Committee of the American Society for Reproductive Medicine. Diagnostic evaluation of the infertile female: a committee opinion. *Fertil Steril* 2015; 103:e44.
53. Griffith CS, Grimes DA. The validity of the postcoital test. *Am J Obstet Gynecol* 1990; 162:615.
54. Collins JA, So Y, Wilson EH, et al. The postcoital test as a predictor of pregnancy among 355 infertile couples. *Fertil Steril* 1984; 41:703.
55. Glatstein IZ, Best CL, Palumbo A, et al. The reproducibility of the postcoital test: a prospective study. *Obstet Gynecol* 1995; 85:396.
56. Oei SG, Helmerhorst FM, Bloemenkamp KW, et al. Effectiveness of the postcoital test: randomised controlled trial. *BMJ* 1998; 317:502.
57. Practice Committee of the American Society for Reproductive Medicine. Current clinical irrelevance of luteal phase deficiency: a committee opinion. *Fertil Steril* 2015; 103:e27.
58. Balasch J, Fábregues F, Creus M, Vanrell JA. The usefulness of endometrial biopsy for luteal phase evaluation in infertility. *Hum Reprod* 1992; 7:973.
59. Edwards RG. Physiological and molecular aspects of human implantation. *Hum Reprod* 1995; 10 Suppl 2:1.
60. Creus M, Balasch J, Ordi J, et al. Integrin expression in normal and out-of-phase endometria. *Hum Reprod* 1998; 13:3460.
61. Giudice LC. Potential biochemical markers of uterine receptivity. *Hum Reprod* 1999; 14 Suppl 2:3.
62. Murray MJ, Meyer WR, Zaino RJ, et al. A critical analysis of the accuracy, reproducibility, and clinical utility of histologic endometrial dating in fertile women. *Fertil Steril* 2004; 81:1333.
63. Davis OK, Berkeley AS, Naus GJ, et al. The incidence of luteal phase defect in normal, fertile women, determined by serial endometrial biopsies. *Fertil Steril* 1989; 51:582.
64. Coutifaris C, Myers ER, Guzick DS, et al. Histological dating of timed endometrial biopsy tissue is not related to fertility status. *Fertil Steril* 2004; 82:1264.
65. Bauman JE. Basal body temperature: unreliable method of ovulation detection. *Fertil Steril* 1981; 36:729.
66. Kambic R, Gray RH. Interobserver variation in estimation of day of conception intercourse using selected natural family planning charts. *Fertil Steril* 1989; 51:430.
67. Shibahara H, Mitsuo M, Inoue M, et al. Relationship between human in-vitro fertilization and intracytoplasmic sperm injection and the zona-free hamster egg penetration test. *Hum Reprod* 1998; 13:1928.
68. Zainul Rashid MR, Fishel SB, Thornton S, et al. The predictive value of the zona-free hamster egg penetration test in relation to in-vitro fertilization at various insemination concentrations. *Hum Reprod* 1998; 13:624.

69. Gump DW, Gibson M, Ashikaga T. Lack of association between genital mycoplasmas and infertility. *N Engl J Med* 1984; 310:937.
70. Kallen CB, Arici A. Immune testing in fertility practice: truth or deception? *Curr Opin Obstet Gynecol* 2003; 15:225.
71. Papanikolaou EG, Vermae V, Kolibianakis E, et al. Is chromosome analysis mandatory in the initial investigation of normovulatory women seeking infertility treatment? *Hum Reprod* 2005; 20:2899.
72. Riccaboni A, Lalatta F, Caliarì I, et al. Genetic screening in 2,710 infertile candidate couples for assisted reproductive techniques: results of application of Italian guidelines for the appropriate use of genetic tests. *Fertil Steril* 2008; 89:800.
73. Dancet EA, D'Hooghe TM, van der Veen F, et al. "Patient-centered fertility treatment": what is required? *Fertil Steril* 2014; 101:924.
74. ESHRE Task Force on Ethics and Law, including, Dondorp W, de Wert G, et al. Lifestyle-related factors and access to medically assisted reproduction. *Hum Reprod* 2010; 25:578.
75. Ethics Committee of American Society for Reproductive Medicine. Child-rearing ability and the provision of fertility services: a committee opinion. *Fertil Steril* 2013; 100:50.
76. Pandey S, Maheshwari A, Bhattacharya S. Should access to fertility treatment be determined by female body mass index? *Hum Reprod* 2010; 25:815.
77. Ethics Committee of American Society for Reproductive Medicine. Access to fertility treatment by gays, lesbians, and unmarried persons: a committee opinion. *Fertil Steril* 2013; 100:1524.
78. Ethics Committee of American Society for Reproductive Medicine. Human immunodeficiency virus (HIV) and infertility treatment: a committee opinion. *Fertil Steril* 2015; 104:e1.
79. Collins JA, Wrixon W, Janes LB, Wilson EH. Treatment-independent pregnancy among infertile couples. *N Engl J Med* 1983; 309:1201.
80. Frisch RE. The right weight: body fat, menarche and ovulation. *Baillieres Clin Obstet Gynaecol* 1990; 4:419.
81. Kiddy DS, Hamilton-Fairley D, Bush A, et al. Improvement in endocrine and ovarian function during dietary treatment of obese women with polycystic ovary syndrome. *Clin Endocrinol (Oxf)* 1992; 36:105.
82. Pasquali R, Antenucci D, Casimirri F, et al. Clinical and hormonal characteristics of obese amenorrheic hyperandrogenic women before and after weight loss. *J Clin Endocrinol Metab* 1989; 68:173.
83. Clark AM, Ledger W, Galletly C, et al. Weight loss results in significant improvement in pregnancy and ovulation rates in anovulatory obese women. *Hum Reprod* 1995; 10:2705.
84. Crosignani PG, Colombo M, Vegetti W, et al. Overweight and obese anovulatory patients with polycystic ovaries: parallel improvements in anthropometric indices, ovarian physiology and fertility rate induced by diet. *Hum Reprod* 2003; 18:1928.
85. Guzick DS, Wing R, Smith D, et al. Endocrine consequences of weight loss in obese, hyperandrogenic, anovulatory women. *Fertil Steril* 1994; 61:598.
86. Mutsaerts MA, van Oers AM, Groen H, et al. Randomized Trial of a Lifestyle Program in Obese Infertile Women. *N Engl J Med* 2016; 374:1942.
87. Snow RC, Barbieri RL, Frisch RE. Estrogen 2-hydroxylase oxidation and menstrual function among elite oarswomen. *J Clin Endocrinol Metab* 1989; 69:369.
88. REIFENSTEIN EC Jr. Psychogenic or hypothalamic amenorrhea. *Med Clin North Am* 1946; 30:1103.
89. Yen SS, Rebar R, Vandenberg G, et al. Pituitary gonadotrophin responsiveness to synthetic LRF in subjects with normal and abnormal hypothalamic-pituitary-gonadal axis. *J Reprod Fertil Suppl* 1973; 20:137.
90. Crowley WF Jr, Filicori M, Spratt DI, Santoro NF. The physiology of gonadotropin-releasing hormone (GnRH) secretion in men and women. *Recent Prog Horm Res* 1985; 41:473.
91. Berga SL, Girton LG. The psychoneuroendocrinology of functional hypothalamic amenorrhea. *Psychiatr Clin North Am* 1989; 12:105.
92. Laughlin GA, Dominguez CE, Yen SS. Nutritional and endocrine-metabolic aberrations in women with functional hypothalamic amenorrhea. *J Clin Endocrinol Metab* 1998; 83:25.
93. Reame NE, Sauder SE, Case GD, et al. Pulsatile gonadotropin secretion in women with hypothalamic amenorrhea: evidence that reduced frequency of gonadotropin-releasing hormone secretion is the mechanism of persistent anovulation. *J Clin Endocrinol Metab* 1985; 61:851.
94. Berga SL, Marcus MD, Loucks TL, et al. Recovery of ovarian activity in women with functional hypothalamic amenorrhea who were treated with cognitive behavior therapy. *Fertil Steril* 2003; 80:976.
95. Abraham S, Mira M, Llewellyn-Jones D. Should ovulation be induced in women recovering from an eating disorder or who are compulsive exercisers? *Fertil Steril* 1990; 53:566.
96. Legro RS, Brzyski RG, Diamond MP, et al. Letrozole versus clomiphene for infertility in the polycystic ovary syndrome. *N Engl J Med* 2014; 371:119.
97. Weiss NS, Nahuis MJ, Bordewijk E, et al. Gonadotrophins versus clomifene citrate with or without intrauterine insemination in women with normogonadotropic anovulation and clomifene failure (M-OVIN): a randomized, two-by-two factorial trial. *Lancet* 2018; 391:758.
98. Thessaloniki ESHRE/ASRM-Sponsored PCOS Consensus Workshop Group. Consensus on infertility treatment related to polycystic ovary syndrome. *Fertil Steril* 2008; 89:505.
99. Farquhar C, Vandekerckhove P, Lilford R. Laparoscopic "drilling" by diathermy or laser for ovulation induction in anovulatory polycystic ovary syndrome. *Cochrane Database Syst Rev* 2001; :CD001122.
100. Farhi J, Ben-Haroush A, Lande Y, Fisch B. Role of treatment with ovarian stimulation and intrauterine insemination in women with unilateral tubal occlusion diagnosed by hysterosalpingography. *Fertil Steril* 2007; 88:396.
101. Honoré GM, Holden AE, Schenken RS. Pathophysiology and management of proximal tubal blockage. *Fertil Steril* 1999; 71:785.

102. Pinto AB, Hovsepian DM, Wattanakumtornkul S, Pilgram TK. Pregnancy outcomes after fallopian tube recanalization: oil-based versus water-soluble contrast agents. *J Vasc Interv Radiol* 2003; 14:69.
103. Letterie GS, Sakas EL. Histology of proximal tubal obstruction in cases of unsuccessful tubal canalization. *Fertil Steril* 1991; 56:831.
104. Tan J, Tannus S, Taskin O, et al. The effect of unilateral tubal block diagnosed by hysterosalpingogram on clinical pregnancy rate in intrauterine insemination cycles: systematic review and meta-analysis. *BJOG* 2019; 126:227.
105. Practice Committee of the American Society for Reproductive Medicine. Committee opinion: role of tubal surgery in the era of assisted reproductive technology. *Fertil Steril* 2012; 97:539.
106. Johnson NP, Mak W, Sowter MC. Surgical treatment for tubal disease in women due to undergo in vitro fertilisation. *Cochrane Database Syst Rev* 2004; :CD002125.
107. Tsiami A, Chaimani A, Mavridis D, et al. Surgical treatment for hydrosalpinx prior to in-vitro fertilization embryo transfer: a network meta-analysis. *Ultrasound Obstet Gynecol* 2016; 48:434.
108. Heinonen PK, Saarikoski S, Pystynen P. Reproductive performance of women with uterine anomalies. An evaluation of 182 cases. *Acta Obstet Gynecol Scand* 1982; 61:157.
109. Bosteels J, van Wessel S, Weyers S, et al. Hysteroscopy for treating subfertility associated with suspected major uterine cavity abnormalities. *Cochrane Database Syst Rev* 2018; 12:CD009461.
110. March CM, Israel R. Gestational outcome following hysteroscopic lysis of adhesions. *Fertil Steril* 1981; 36:455.
111. Pérez-Medina T, Bajo-Arenas J, Salazar F, et al. Endometrial polyps and their implication in the pregnancy rates of patients undergoing intrauterine insemination: a prospective, randomized study. *Hum Reprod* 2005; 20:1632.
112. Coutifaris C, Myers ER, Guzick DS, et al. Histological dating of timed endometrial biopsy tissue is not related to fertility status. *Fertil Steril* 2004; 82:1264.
113. Practice Committee of the American Society for Reproductive Medicine. Current clinical irrelevance of luteal phase deficiency: a committee opinion. *Fertil Steril* 2015; 103:e27.
114. Helmerhorst FM, Van Vliet HA, Gornas T, et al. Intra-uterine insemination versus timed intercourse for cervical hostility in subfertile couples. *Cochrane Database Syst Rev* 2005; :CD002809.