

# Case Report: Electroacupuncture Therapy Combined with Oral Supplements for Male Infertility

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## ABSTRACT

### Background

Male infertility accounts for half of the reported infertility cases worldwide. Acupuncture serves as an alternative therapy for treating gynecological disorders and improving sperm quality.

### Case presentation

We present two Indonesian male infertility patients, aged 32 and 29, diagnosed with oligozoospermia and teratozoospermia, respectively. Both patients underwent electroacupuncture (EA) therapy twice a week for 12 sessions and took oral supplements such as coenzyme, L-carnitine, and alpha-lipoic acid once daily for six weeks following the initial EA therapy. Sperm analysis was conducted before and after EA therapy.

### Conclusion

Our findings suggest that EA therapy and oral supplements may complement conventional treatments for male infertility. However, additional studies with larger sample sizes and longer follow-up periods are necessary to confirm the effectiveness of EA therapy in enhancing sperm quality and fertility outcomes in male infertility patients.

### Keywords

Case report; Electroacupuncture; Infertile; Male

## INTRODUCTION

Male infertility is a complex condition with multiple contributing causes. It is estimated that male factors account for about half of all infertility cases. The main abnormalities usually involve changes in sperm number and quality <sup>1,2</sup>. Semen analysis is routinely used to evaluate a man's fertility potential, focusing on parameters such as sperm concentration, motility, and morphology. However, having abnormal semen parameters does not always mean that a man is infertile <sup>3</sup>.

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A wide range of attempts has been made to identify additional parameters that could better describe male fertility. Among these, total motile sperm count (TMSC) and the DNA fragmentation index (DFI) are often used as indicators of male reproductive potential. TMSC is obtained by multiplying the total sperm count by the proportion of progressively motile sperm, and a value of at least 20 million is generally considered normal<sup>4</sup>. Several pharmacological approaches, such as combinations of coenzyme Q10 and L-carnitine, as well as herbal preparations, have been investigated for their potential benefits on sperm concentration, motility, and morphology in infertile men<sup>5</sup>.

A decline in male fertility has been associated with a variety of factors, including sperm DNA damage, environmental exposures, lifestyle habits such as smoking, alcohol consumption, obesity, increasing age, psychological stress, and dietary patterns, as well as occupational conditions<sup>6-8</sup>. Obesity, in particular, has been linked to hormonal disturbances and may impair semen quality, thereby contributing to male reproductive dysfunction<sup>9</sup>. In addition to lifestyle-related influences, congenital and endocrine conditions such as undescended testis and mild androgen insensitivity syndrome have been reported as important contributors to impaired spermatogenesis and hypogonadism<sup>10,11</sup>. Infertility is also associated with anxiety, depression, and other psychological burdens among affected couples, indicating that the consequences extend beyond the physical domain<sup>12</sup>. Assessing sperm DNA fragmentation has been suggested as a way to obtain a more refined picture of sperm quality, and DFI values exceeding 30% have been associated with a higher likelihood of infertility or lower chances of achieving pregnancy<sup>13</sup>.

Acupuncture has long been used as an adjunctive therapy in the management of reproductive and gynecological complaints<sup>14</sup>. Neuroimaging and experimental data suggest that acupuncture can modulate activity in several brain regions, including the somatosensory cortex, limbic system, basal ganglia, brainstem, and cerebellum, with these responses depending on both the site and depth of needle insertion<sup>15</sup>. In clinical practice, fine needles are inserted into selected meridian points with the intention of regulating the flow of Qi and restoring functional balance within the body<sup>16</sup>.

This case report presents the case of an infertile male treated with electroacupuncture (EA) and oral therapy.

Furthermore, before and after EA assessments, DFI, TMSC, sperm morphology, and sperm motility.

## Case Report

### Case 1

A 32-year-old Indonesian male patient presented with three years of infertility, indicated by abnormal results of a spermiogram (oligozoospermia and teratozoospermia), as shown in Table 1. He reported no relevant family medical or genetic history. The patient had previously received oral antioxidant therapy.

Patients received up to 12 EA treatments twice weekly. Needles were inserted into specially selected acupuncture points (acupoints) to match the meridians. The EA protocol used a set of standard reproductive acupoints, namely CV 4 (Guanyuan)<sup>17-20</sup>, ST 36 (Zusanli)<sup>17,19-21</sup>, KI 3 (Taixi) bilaterally<sup>19,20,22</sup>, CV 6 (Qihai)<sup>19,22</sup>, SP 6 (Sanyinjiao)<sup>19,20,22</sup>, ST 29 (Guilai)<sup>20,23,24</sup>, and LI 4 (Hegu)<sup>19</sup>.

Point localization was performed with the patient in the supine position. After skin disinfection with an antiseptic solution, sterile, disposable stainless-steel acupuncture needles (Huanqiu, China) sized 0.25 × 25 mm or 0.25 × 40 mm (depending on body mass index) were gently inserted until the deqi sensation was obtained. The needles were then connected to an electrostimulation device (Hwato SDZ V, Shanghai, China) for 15 minutes, delivering continuous waves at a frequency of 2 Hz. After 15 minutes, the stimulator was turned off, the electrodes were removed, and the needles were removed.

The patient also received oral therapy, including coenzyme Q, L-carnitine, and alpha-lipoic acid, once daily for six weeks following the first EA session. Daily evaluation of routine oral drug administration was done in hopes that administering EA therapy and oral therapy would improve sperm parameters. The unexpected discontinuation of the treatment occurred due to the patient's noncompliance with prescribed procedures.

Patients were examined for sperm analysis before and after EA and were asked not to ejaculate for 2-7 days before sperm collection<sup>25</sup>. The DFI test using the Sperm Chromatin Dispersion test / SpermFunc DNAf calculates the percentage of total sperm and compares the damaged sperm DNA with all observed sperm. For the TMSC assay using the Chamber Makler, multiply sperm volume (mL), sperm concentration (x10<sup>6</sup>), and the percentage of sperm with progressive motility (%),

and divide by 100% <sup>26</sup>. Morphological assessment of sperm was done according to the World Health Organization (WHO) (2010), where normal sperm have an oval head shape, and the acrosome covers 40% to 70% of the head area. Sperm have a neck, midpiece, and no tail abnormalities or cytoplasmic droplets >50% of the size of the sperm head. The percentage of sperm with normal morphology to total sperm measured was  $\geq 4\%$  <sup>27</sup>.

**Table 1.** The result of Before EA and After EA Sperm Analysis

Parameter	Result	
	Before EA	After EA
<b>Sperm Analysis</b>		
<b>Macroscopic</b>		
Color	Pearl White	Pearl White
Liquefaction (minutes)	20	20
Consistency (cm)	<2	<2
Odor	Typical	Typical
Volume (ml)	2.4	2.7
pH	7.5	7.5
<b>Microscopic</b>		
Concentration (million/ml)	12.9	19.5
Total number of spermatozoa (million/ejaculate)	30.96	52.6
<b>Motility:</b>		
a. Progressive motility (%)	37	50
b. Non-progressive motility (%)	11	7
c. Immotility (%)	52	43
d. Total motility (%)	48	57
Agglutination	+	+
Leukocyte (million/ml)	1.2	0.7
Erythrocyte (million/ml)	2.2	0
Normal Morphology (%)	2	3
<b>Impression</b>	Oligoteratozoospermia	Teratozoospermia
<b>DNA Fragmentation Index (%)</b>		
Index (%)	19.4	15
Total Motile Sperm Count (million)	11.45	26.30

EA: Electroacupuncture

Table 1 shows the improvement of TMSC and DFI in the sperm analysis results before and after EA therapy. Concentration increased from 12.9 million/ml to 19.5 million/ml, the total number of spermatozoa increased from 30.96 million/ejaculate to 52.6 million/ejaculate, progressive motility increased from 37% to 50%, leukocyte decreased from 1.2 million/ml to 0.7 million/ml, erythrocyte decreased from 2.2 million/ml to 0 million/ml, normal morphology increased from 2% to 3%, DFI decreased from 19.4% to 15%, and TMSC increased from 11.45 million to 26.30 million. The impression of the sperm analysis before EA therapy, as shown in Table 1, was oligo-teratozoospermia (small number of sperm and abnormal sperm morphology), and after EA was teratozoospermia (abnormal sperm morphology) <sup>28</sup>.

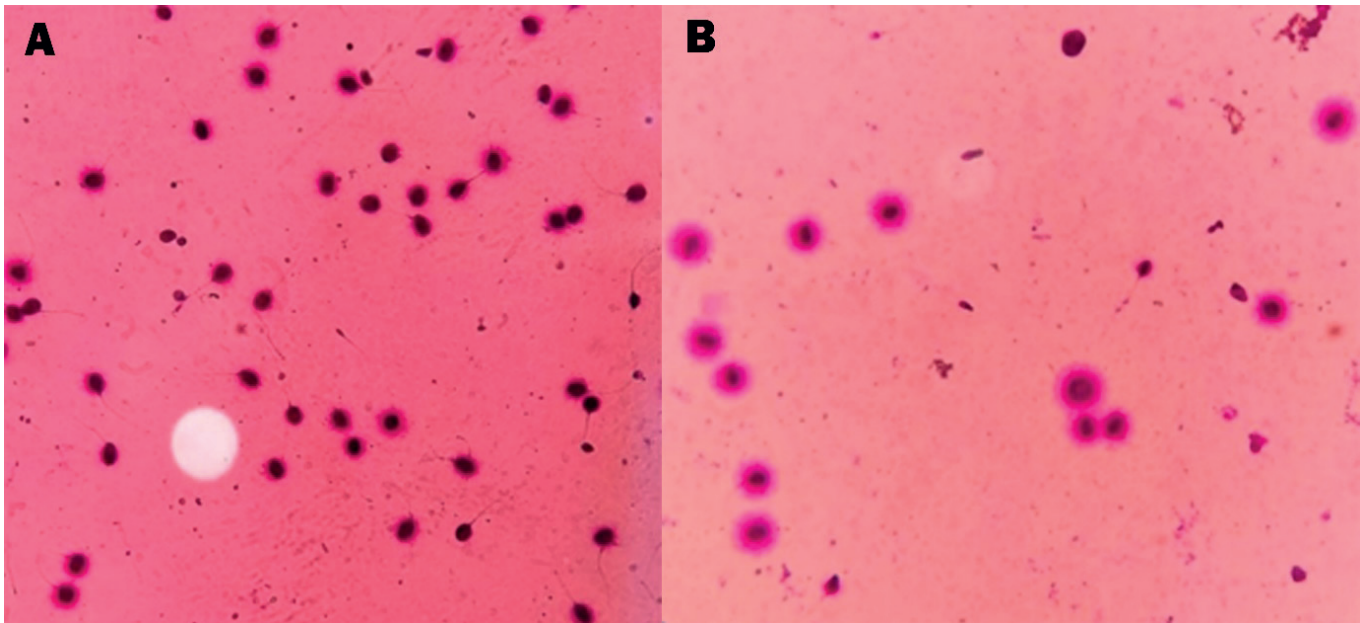
## Case 2

A 29-year-old Indonesian male patient with three years of infertility, as indicated by the abnormal result of the spermiogram, which showed teratozoospermia (see Table 2). The patients received the same EA and oral therapy as in Case 1 and had no family medical history or relevant genetic information. The patient has previously received an oral antioxidant intervention.

The patient underwent up to 12 EA treatments twice weekly, with sperm analysis examinations conducted before and after EA, as in Case 1.

**Table 2.** The result of Before EA and After EA Sperm Analysis

Parameter	Result	
	Before EA	After EA
<b>Sperm Analysis</b>		
<b>Macroscopic</b>		
Color	Pearl White	Pearl White
Liquefaction (minutes)	20	20
Viscosity (cm)	<2	<2
Odor	Typical	Typical
Volume (ml)	2.3	0.9
pH	7.2	7.5
<b>Microscopic</b>		
Concentration (million/ml)	33	39.9
Total number of spermatozoa (million/ejaculate)	75.9	75.8



**Figure 1.** Changes in DNA Fragmentation Index Before (A) and After (B) Electroacupuncture Therapy.

Figure 1(A) shows that before the EA DFI examination, the result was 19.4%, while Figure 1(B) indicates an improvement after EA DFI, with a result of 15%.

Parameter	Result	
	Before EA	After EA
Motility:		
a. Progressive motility (%)	51	58
b. Non-progressive motility (%)	11	5
c. Immotility (%)	38	37
d. Motility total (%)	62	63
Agglutination	-	-
Leukocyte (million/ml)	0	0
Erythrocyte (million/ml)	0	0
Normal Morphology (%)	2	10
<b>Impression</b>	Teratozoospermia	Normozoospermia
DNA Fragmentation Index (%)	22	11.4
Total Motile Sperm Count (Million)	38.70	43.96

EA: Electroacupuncture

Table 2 demonstrates the improvement in TMSC, DFI, and morphology in the sperm analysis results after EA treatment compared to those before EA treatment. The concentration increased from 33 million/ml to 39.9 million/ml, progressive motility increased from 51% to 58%, normal morphology increased from 2% to 10%,

DFI decreased from 22% to 11.4%, and TMSC increased from 38.70 million to 43.96 million. The impression of the sperm analysis before EA treatment in Table 2 was teratozoospermia (abnormal sperm morphology), while after EA treatment, it was normozoospermia (normal sperm)<sup>28</sup>.

### Follow-up and outcomes

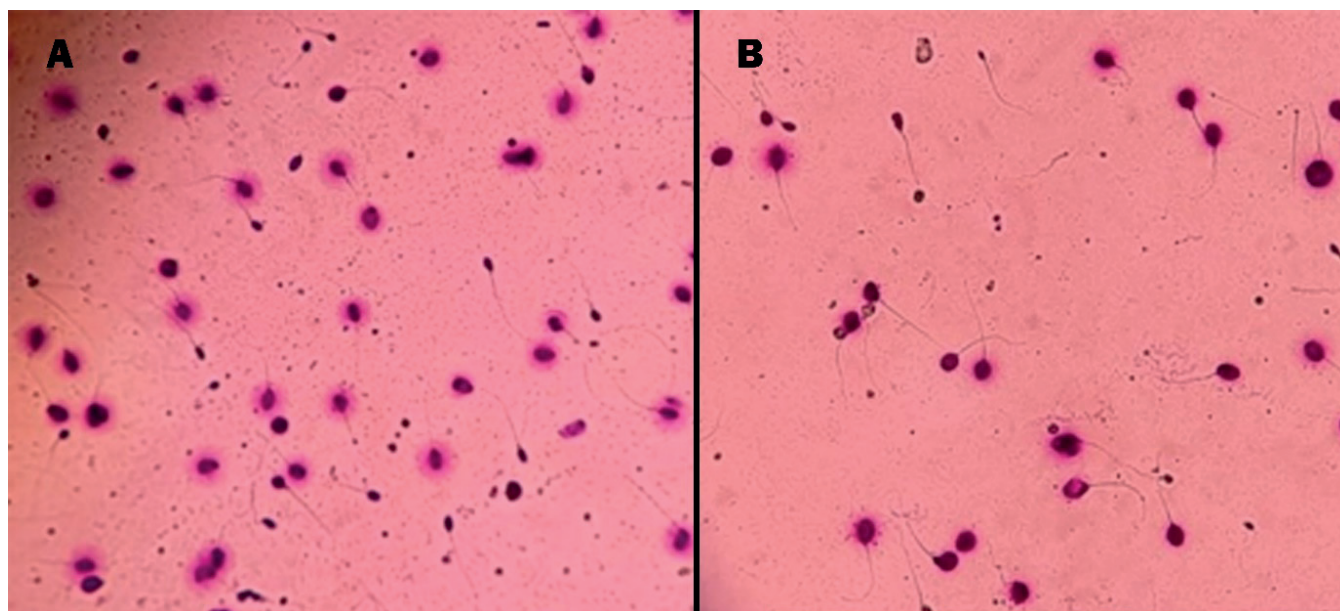
During EA therapy sessions, patients reported feeling less tired, more relaxed, and energetic. This subjective improvement in well-being is consistent with the traditional Chinese medicine theory that EA therapy can promote the flow of Qi and balance the body's energy<sup>16</sup>.

### Ethical Clearance

Ethical approval to report this case was obtained from the Research Ethics Committee at Dr. Moewardi Hospital, Surakarta, Indonesia, under No. 378/ III / HREC/ 2021.

## DISCUSSION

This case report aims to assess the effectiveness of EA therapy in treating male infertility. Acupuncture, which involves inserting needles into specific points on the body and connecting meridians to restore balance, has been used for over 2,000 years<sup>16</sup>. Research has



**Figure 2.** Changes in DNA Fragmentation Index Before (A) and After (B) Electroacupuncture Therapy.

Figure 2 (A) shows that before the EA DFI examination, the result was 22%, while Figure 2(B) indicates an improvement after the EA DFI, with a result of 11.4%.

shown that acupuncture can improve sperm motility and morphology<sup>17,20</sup>. This case report demonstrated an increase in TMSC, improved sperm morphology, and a decrease in DFI. These results align with previous studies showing that acupuncture has a positive impact on low-quality sperm concentration, sperm motility, and sperm production<sup>29</sup>. However, acupuncture was found to have no significant effect on pregnancy rates in cases of male infertility<sup>29</sup>. In addition, other adjunctive interventions such as combinations of coenzyme Q10, L-carnitine, and herbal preparations have also been reported to improve semen parameters in infertile men<sup>5</sup>.

In idiopathic male infertility, men treated with EA have been shown to achieve significantly better sperm parameters than those receiving only placebo therapy. Further studies revealed that the improvement in sperm parameters was related to the advancement of ultrastructural forms of the spermatozoa, such as the nucleus and axoneme, observed through transmission electron microscopy. This is likely related to the reduced DNA fragmentation index and increased TMSC in both cases discussed above<sup>30</sup>. In addition, EA can facilitate the recovery of spermatogenesis in subfertile patients by increasing germ cell proliferation through enhancing Sertoli cell function<sup>21,18</sup>.

## CONCLUSION

After 12 sessions of EA and oral treatment, there was an improvement in the total number of spermatozoa, progressive motility, erythrocytes, normal morphology, TMSC, and a decrease in DFI. However, further research is needed to better understand the mechanisms underlying the efficacy of EA therapy and to explore the potential benefits of combining EA therapy with other treatments.

## Informed consent

Written informed consent was obtained from the patient(s) for their anonymized information to be published in this article.

## Author contributions

Funding acquisition: URB, BM, TP, and IN. The investigation: URB, AL, EM, HP, LS, MS. Validation: BM, TP, IN. Writing original draft: URB. All authors: Review and editing.

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## REFERENCES

- Krausz C, Riera-Escamilla A. Genetics of male infertility. *Nat Rev Urol*. 2018;**15**(6):369–84.
- Shiraishi K, Matsuyama H. Effects of medical comorbidity on male infertility and comorbidity treatment on spermatogenesis. *Fertil Steril*. 2018;**110**(6):1006-1011.e2.
- Ford WCL. Comments on the release of the 5th edition of the WHO Laboratory Manual for the Examination and Processing of Human Semen. *Asian J Androl*. 2010;**12**(1):59–63.
- Hamilton JAM, Cissen M, Brandes M, Smeenk JMJ, De Bruin JP, Kremer JAM, et al. Total motile sperm count: A better indicator for the severity of male factor infertility than the WHO sperm classification system. *Hum Reprod*. 2015;**30**(5):1110–21.
- Mahnaz KJ, Athar RJ, Marzieh KJ, Marzeyeh L. Comparison of the Effects of Nettle and Alyssum with Q10 Plus and L-Carnitine on Improving Sperm Parameters of Infertile Men. *Bangladesh J Med Sci*. 2024;**23**(2):398–406.
- Dissanayake DMIH, Keerthirathna WLR, Peiris LDC. Male Infertility Problem: A Contemporary Review on Present Status and Future Perspective. *Genet Genome*. 2019;**3**:247028971986824.
- Sun TC, Zhang Y, Li HT, Liu XM, Yi DX, Tian L, et al. Sperm DNA fragmentation index, as measured by sperm chromatin dispersion, might not predict assisted reproductive outcome. *Taiwan J Obstet Gynecol*. 2018;**57**(4):493–8.
- Agarwal A, Baskaran S, Parekh N, Cho CL, Henkel R, Vij S, et al. Male infertility. *Lancet*. 2021;**397**(10271):319–33.
- Ahmad R, Haque M. Obesity inflicted reproductive complications and infertility in men. *Bangladesh J Med Sci*. 2023;**22**(01):7–14.
- Mukhtar AF, Ismail SB, Sains U, Sains U, Kerian K, Kerian K, et al. Mild Androgen Insensitivity Syndrome presenting in male with infertility and sexual difficulties. *Bangladesh J Med Sci*. 2023;**22**(02):442–4.
- Yuri P, Wenang S, Febrianti L, Dewi A, Rizal DM, Lelle RJ. Impact of Men with Undescended Testis on Fertility and Hormonal Function Promoting Hypogonadism. *Bangladesh J Med Sci*. 2023;**22**(04):859–68.
- Anh VTK, Huy TQ, Huong T Van, Quyen LTN, Dung TV. Anxiety, Depression and Some Related Factors in Infertile Couples Being Treated at a Provincial Reproductive Health Care Center, in the South of Vietnam. *Bangladesh J Med Sci*. 2023;**22**(02):360–7.
- Marchlewska K, Filipiak E, Walczak-Jedrzejowska R, Oszukowska E, Sobkiewicz S, Wojt M, et al. Sperm DNA Fragmentation Index and Hyaluronan Binding Ability in Men from Infertile Couples and Men with Testicular Germ Cell Tumor. *Biomed Res Int*. 2016;2016.
- Qu F, Li R, Sun W, Lin G, Zhang R, Yang J, et al. Use of electroacupuncture and transcutaneous electrical acupoint stimulation in reproductive medicine: a group consensus. *J Zhejiang Univ Sci B*. 2017;**18**(3):186–93.
- Huang W, Pach D, Napadow V, Park K, Long X, Neumann J, et al. Characterizing acupuncture stimuli using brain imaging with fMRI - a systematic review and meta-analysis of the literature. *PLoS One*. 2012;**7**(4):
- Ho LM, Chui SL, Hum SC, Foo JQM, Fook-Chong SMC, Chong SF, et al. A single-arm pilot study on effects of acupuncture treatment on semen parameters of subfertile Singaporean men. *Asian Pacific J Reprod*. 2015;**4**(4):266–71.
- Yu Y, Sha S Bin, Zhang B, Guan Q, Liang M, Zhao LG, et al. Effects and mechanism of action of transcutaneous electrical acupuncture point stimulation in patients with abnormal semen parameters. *Acupunct Med*. 2019;**37**(1):25–32.
- Gao J, Zuo Y, So K-H, Yeung WSB, Ng EHY, Lee K-F. Electroacupuncture enhances spermatogenesis in rats after scrotal heat treatment. *Spermatogenesis*. 2012;**2**(1):53–62.
- Zhu J, Arsovska B, Kozovska K. Case Report : Oligoasthenozoospermia , Treatment with Acupuncture. *Imp J Interdiscip Res*. 2016;**2**(9):1592–4.
- Dieterle S, Li C, Greb R, Bartzsch F, Hatzmann W, Huang D. A prospective randomized placebo-controlled study of the effect of acupuncture in infertile patients with severe oligoasthenozoospermia. *Fertil Steril*. 2009;**92**(4):1340–3.
- Cui T wei, Qin M, Liu B xing, Gao Y xiao, Ma W jing, Zhang X ping. Effect of Electroacupuncture on Spermatogenesis in Rats with Oligozoospermia of Insufficiency of Shen (Kidney) Essence Syndrome. *Chin J Integr Med*. 2019;**25**(4):292–7.
- Jo J, Lee SH, Lee JM, Jerng UM. Semen Quality Improvement in a Man with Idiopathic Infertility Treated with Traditional Korean Medicine: A Case Report. *Explor J Sci Heal*. 2015;**11**(4):320–3.
- Cakmak YO, Akpınar IN, Ekinci G, Bekiroglu N. Point- and frequency-specific response of the testicular artery to abdominal electroacupuncture in humans. *Fertil Steril*. 2008;**90**(5):1732–8.
- Yao DF, Mills JN. Male infertility: Lifestyle factors and holistic, complementary, and alternative therapies. *Asian J Androl*. 2016;**18**(3):410–8.
- Jakubik-Uljasz J, Gill K, Rosiak-Gill A, Piasecka M.

- Relationship between sperm morphology and sperm DNA dispersion. *Transl Androl Urol.* 2020;**9**(2):405–15.
26. Nikbakht R, Saharkhiz N. The influence of sperm morphology, total motile sperm count of semen and the number of motile sperm inseminated in sperm samples on the success of intrauterine insemination. *Int J Fertil Steril.* 2011;**5**(3):168–73.
27. WHO. WHO Laboratory Manual for the Examination and Processing of Human Semen. fifth edit. World Health Organization. *World Health Organization*; 2010. 1–271 p.
28. Jo J, Kang MJ. Successful treatment of oligoasthenozoospermia using traditional Korean medicine resulting in spontaneous pregnancy: Two case reports. *Explor J Sci Heal.* 2016;**12**(2):136–8.
29. Jerng UM, Jo JY, Lee S, Lee JM, Kwon O. The effectiveness and safety of acupuncture for poor semen quality in infertile males: A systematic review and meta-analysis. *Asian J Androl.* 2014;**16**(6):884–91.
30. Pei J, Strehler E, Noss U, Abt M, Piomboni P, Baccetti B, et al. Quantitative evaluation of spermatozoa ultrastructure after acupuncture treatment for idiopathic male infertility. *Fertil Steril.* 2005;**84**(1):141–7.
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