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EFFECTS OF DIFFERENT ANTIBIOTICS ADMINISTERED TO INFERTILE MEN WITH LEUKOCYTOSPERMIA ON THE SPERM PARAMETERS

Muhammad-Baqir M-R Fakhrildin[1], Mohammad Oda Selman[2*] and Dhamyaa Abed Najim[3]

[1]Department of Clinical Reproductive Physiology, High Institute of Infertility Diagnosis and ART.

[2]Head of Department of Applied embryology High Instituteof Infertility Diagnosis and ART.

[3]Department of Applied Embryology / High Institute of Infertility Diagnosis and ART/ Al-Nahrain University

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***Correspondence for Author**
Dr. Mohammad Oda Selman
Head of Department of Applied embryology High Instituteof Infertility Diagnosis and ART.

ABSTRACT

Background: Antibiotics are widely used in the treatment of male infertility, as well as in the different fields of ARTs. However, these antibiotics are related to some harmful effects on sperm parameters. **Aim of the study:** to find out the effects of antibiotics (Ciprofloxacin. Metronidazole and Levofloxacin) on sperm motility parameters. **Materials and methods:** Three antibiotics were used involving (ciprofloxacin, metronidazole and levofloxacin (Collectively, sperm grade activity in random ten fields have been counted and the percentages of each grade mean respectively were tallied by using electronic calculator. **Result:** There are non-significant decrease in the sperm progressive motility and immotility post-treatment as compared with pre-treatment when using ciprofloxacin and metronidazole. There was significant decrease in immotile sperm count and increase in progressive motility, by using levofluxacine as compared with pre-treated group. **Conclusion:** Administration of antibiotics may increase round cells count and increase count of germ cells in leukocytospermic men.

KEYWORD: Ciprofloxacin, Metronidazole, Levofloxacin, sperm motility, leukocytospermia.

INTRODUCTION

Infertility affects approximately 15% of all couples trying to conceive and a male factor is the contributing factor in roughly half of the cases,[1] Semen analysis is routinely used to evaluate the male partner in infertile couples.[2] Sperm motility was assessed as soon as possible after liquefaction of samples uniformed within an hour to limit the undesired effects of dehydration,[3] The presence of leukocytes in semen has been associated with poor sperm quality,[4] Investigations of the significance of leukocytospermia in male infertility have yielded conflicting results.[5]

Ciprofloxacin is a broad-spectrum bactericidal anti-infective agent of the fluoroquinolone class,[6] It is approved for the treatment of 14 types of infections, especially urinary tract infections such as acute uncomplicated cystitis and chronic bacterial prostatitis, and lower respiratory infections[7] Levofloxacin (LVFX) is the L-isomer of the racemic drug ofloxacin. Like other fluoroquinolones, it inhibits both bacterial (DNA) gyrase and topoisomerase (IV); the primary enzymatic target varies for different species of bacteria.[8] It is widely used in the treatment of urinary tract infections. LVFX penetrates well into polymorphonuclear leukocytes, which can act as vehicles for transport and delivery of the active drug to sites of infections,[9] Metronidazole (MTZ) first report on the effect of metronidazole for the management of anaerobic infections and it is classified as antiamoebic, antigiardiasis, and antibacterial.[10]

Aim of the study

To find out the effects of antibiotics (Ciprofloxacin. Metronidazole and Levofloxacin) on sperm motility.

MATERIALS AND METHODS

This study includes sixty two men between 20-39 years old who attended to High Institute of Infertility Diagnosis and Assissted Reproductive Technology / AL-Nahrain University from December, 2012 to April, 2013. The age for infertile men was (20-39). Patients attended clinic after investigation them, patients with leuko-cytospermia semen sample are examined under light microscope to measurement sperm motility. Drugs that used are ciprofloxacin, levofloxacin metronidazole which are considered the most common used drugs. Almost semen analyses were done according to the World Health Organization standard 666criteria 2010.[11] The ejaculates were collected in a sterile, non-toxic, disposable petri-dish by masturbation, after abstinence

period of (3-5) days. Specimens were labeled with patient's name and lab number.

Sperm motility was assessed as soon as possible after liquefaction of samples uniformed within an hour to limit the undesired effects of dehydration, pH or changes in temperature.

Systematically scanned slid fields chosen randomly in an area far from the cover slip edge by approximately 5mm to avoid drying effect which could decrease sperm motility. 200 spermatozoa in a total of at least 5 fields was counted and categorized in compliance to WHO 2010, categorization was recorded as follows:

- Progressive motility (PR): spermatozoa moving actively, either linearly or in a large circle, regardless of speed.
- Non-progressive motility (NP): all other patterns of motility with an absence of progression, e.g. swimming in small circles, the flagellar force hardly displacing the head, or when only a flagellar beat can be observed.
- Immotility (IM): no movement.

Collectively, PR, NP and IM of spermatozoa in random ten fields have been counted and the percentages of each grade mean respectively were tallied by using electronic calculator. The lower reference limit for total motility (PR +NP) is 40% (5th centile, 95% CI38–42), and for progressive motility (PR) is 32% (5th centile, 95% CI 31–34).

RESULTS

According to WHO (2010) criteria, infertile patients treated with ciprofloxacin revealed non-significant increment ($P>0.05$) in the sperm motility (%) post-treatment as compared with pre-treatment. Similarly, non-significant difference ($P>0.05$) was observed for non-progressive motility percentages post-treatment as compared with the result pre-treatment as shows in table (1). The result shows non-significant decrease ($P<0.05$) in percentages of sperm motility, while there aresignificant decrease progressive motility post-treatment as compared to the result of pre-treatment when using levofloxacin. However, there are non-significant increment ($P>0.05$) in the result of non-progressive motility post-treatment when compared with the result of pre-treatment when using levofloxacin.

Levofloxacin effect on sperm immotility post-treatment showed non-significant

increment (P<0.05) in the result of when it as compared with pre-treatment as shows in table (2).

The result shows non-significant differences (P>0.05) were assessed in the percentages of sperm motility and non-progressive sperm post-treatment when compared with pre-treatment. In contrast, progressive sperm motility (%) showed non-significant increase (P<0.05) post-treatment and significant increase in immotility as compared to pre-treatment when using metronidazole as shows in table (3).

Table (1): Effect of ciprofloxacin on sperm motility.

Sperm parameters		Treatment by ciprofloxacin	
		Pre- treatment	Post- treatment
Sperm motility (%)		42.105 a ±4.56	43.947 a ±3.31
Sperm grade activity%	Progressive sperm motility	22.894 a ±2.84	20.263 a ±2.74
	Non progressive motility	19.211 a ±2.37	23.684 a ±3.29
	Immotile sperm	57.895 a ±4.56	56.053 a ±3.35

Table (2): Effect of levofloxacin on sperm motility.

Sperm parameters		Treatment by metronidazole	
		Pre- treatment	Post- treatment
Sperm motility (%)		44.500 a ±4.44	38.000 a ±3.45
Sperm grade activity %	Progressive motility	20.250 a ±3.74	10.250 b ±2.28
	Non progressive motility	24.250 a ±2.21	26.750 a ±2.03
	Immotile sperm	55.500 a ±4.44	63.000 a ±3.56

Table (3): Effect of metronidazole on sperm motility.

Sperm motility (%)		**37.89 a ±4.677**	**64.21 a ±3.381**
Sperm grade activity%	Progressive motility	16.84 b ±3.74	42.63 a ±2.28
	Non progressive motility	21.05 a ±1.735	21.58 a ±1.381
	Immotile sperm	62.11 a ±3.791	35.79 b ±2.993

DISCUSSION

The effect of ciprofloxacin treatment on semen quality is controversial. The reports have demonstrated improved seminal parameters after treatment with ciprofloxacin Improvement of sperm motility and activity in infertile patients was reported by Al-Sultani *et al,*[12] The data showed an improvement of sperm motility and activity in infertile patients after treatment with ciprofloxacin. The same finding is reported by Al-Sultani *et al,*[12] this is agreed with the present study that was showed a non-significant increase in sperm motility. In this study, the percentage of sperm progressive motility showed non-significant decrease, it was reported that ciprofloxacin altered membrane properties and decreased rapid progression, Also this result may explained as that ciprofloxacin interferes with the energy production process required for the sperm vitality and sperm motility.[13] Also metronidazole effect on percentage of Sperm motility and progressive sperm motility% were decreased post treatment, the percentage of motile sperm of rabbit and human incubated with MTZ was affected.[14]

The result of this study found a positive effect of levofloxacin on semen (macroscopic and microscopic) parameters. This finding may resulted from the fact that levofloxacin improve semen parameters including sperm motility. Among the antibiotics that penetrate the prostate.[15]

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