A Study on *Trichomonas Vaginalis* and Comparison Between The Efficacy of Metronidazole and Secnizole on Women in Kirkuk Province

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Summary:

Background: *The present study was planned to show the prevalence of Trichomonas vaginalis among reproductive age group women attended the private clinics complaining of gynecological and urinary symptoms and to compare the efficacy of metronidazole and secnizole in eradicating Trichomonas vaginalis in women.*

Patients and Methods: *A study was carried out on 210 women (47 pregnant and 163 non pregnant) attended private clinics in Kirkuk, Iraq, for the period from 1st of February to 1st of July 2004. Each patient examined clinically, vaginal swabs and urine samples were examined microscopically to detect Trichomonas vaginalis. The Trichomonas vaginalis positive cases and their husbands were divided into two groups, one group was treated with metronidazole and the second group with secnizole.*

Results: *It was found that the prevalence of Trichomonas vaginalis was (29.05%), the infection rate in pregnant women was (42.55%). The highest rate of infection was among pregnant women in third trimester of pregnancy (58.33%).The infection rate in non pregnant women was (25.15%) The commonest clinical symptoms among positive cases was vaginal discharge followed by itching, dysuria and dyspareunia.*

Conclusion: *It was found that the efficacy of secnizole was greater than metronidazole in eradicating Trichomonas vaginalis infection and the rate of resistant cases treated with metronidazole 7(30.8%) was higher than those treated with secnizole 3(10.3%).*

Key words: *Trichomonas vaginalis, Metronidazole, Secnizole, Kirkuk*

Introduction:-

Trichomonas vaginalis is a cosmopolitan species found in the reproductive tracts of both men and women all over the world. It lives in the vagina and urethra of women and in the prostate, seminal vesicles and urethra of male. It is transmitted primarily by sexual intercourse [1]. The parasite is a very common cause of infection of the female genito-urinary tract and trichomoniasis is a major sexually transmitted disease [2].

Infection with the organism, while frequently asymptomatic, can cause vaginitis in women and urethritis in men [3]. It is also associated with preterm delivery, low birth weight and increased infant mortality as well as predisposing to HIV/AIDS and cervical cancer [4].

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Diagnosis depends on recognizing the trichomonad in a secretion (wet mount) as flagellated, pear shaped, motile organisms that are somewhat larger than leukocytes, or from in vitro culture made from a vaginal irrigation. Cultivation is recommended to detect low number of organisms. Polymerase chain reaction (PCR) is a highly sensitive and specific test, but is not routinely used nor readily available for *Trichomonas vaginalis* [5,6].

In Baghdad the incidence of *Trichomonas vaginalis* was(13.6%) in females genital tract[7]. , while Shahbander demonstrated *Trichomonas vaginalis* in (19.5%) among illetrate housewives [5,6].

The 5-nitroimidazole drugs, of which metronidazole is the most commonly prescribed, is the only approved effective drug to treat trichomoniasis. Metronidazole is bactericidal, amoebicidal, and trichomonicidal in action, with plasma half life of 6-8 hours in adults with normal renal and hepatic function, is given in a 7 day course of 200-250 mg three times daily or 400 mg twice daily or a single dose of 2 gm [9].

Metronidazole usually cures infection in about 5 days, but resistant strains occur. In vitro tests of such strains required minimal lethal concentration (MLC) of the drug is up to 11 times the MLC of susceptible strains [10].

PATIENTS AND METHODS:-

The study was carried out on 210 women attended private clinics in Kirkuk city for the period from the 1st of February to the 1st of July 2004 ,47 pregnant and 163 non pregnant.

Full clinical history and pelvic examination was carried out for each patient. High vaginal swab was taken from some patients using sterile bivalves Cusco's speculum and sterile cotton swabs without using antiseptics or lubricants, general urine examination was done for those suffering from urinary symptoms, specimens were examined immediately under a microscope and regarded positive when motile Trichomonads were observed.

The positive *Trichomonas vaginalis* patients 61 women(20 pregnant, 41 non pregnant) were divided into two groups, group one (31 women) were treated with metronidazole, 250 mg three times daily for 7 days, group two (30 women, non pregnant) were treated with secnizole 2 gm as a single dose (secnizole, a nitro-imidazole tablet each containing 500mg, The Jordanian Pharmaceutical Manufacturing Co.Ltd; Jordan). Secnizole interacts with DNA, causing inhibition of nucleic acid synthesis and cell death, the half life of secnizole is about 25 hours, which allows for easy dosage regimens. The treatments were given for both partners and advised for sexual abstinance during the period of treatment. The patients were followed up in both groups after termination of the treatment, by clinical examination and laboratory investigations.

Five patients from group one and one patient from group two were excluded from the study because of failure of follow up.

RESULTS:-

Table (1) shows that the rate of *Trichomonas vaginalis* among women attended private clinics in Kirkuk city was (29.05%). The highest rate of infection was among (21-30) years of age followed by (31-40) , (11-20) and (41-50) years old respectively. Statistically there was no significant difference among different age groups (P>0.05).

It is indicated in table (2) that the rate of *Trichomonas vaginalis* among pregnant women was (42.55%), while the prevalence of *Trichomonas vaginalis* among non pregnant women was (25.15%), the difference between the two groups was significant (P<0.05). The infection rate in third trimester of pregnancy was (58.33%) and in second trimester was (41.37%) and (16.66%) among pregnant women in first trimester of pregnancy (table 3). The highest rate of infection was among the pregnant women in third trimester of pregnancy.

Regarding the clinical symptoms associated with *Trichomonas vaginalis*, it is indicated in table (4) that the commonest clinical symptom was vaginal discharge (60.6%), followed by itching (45.9%), dysuria (18%) and dyspareunia (8.2%) and (14.7%) of women were asymptomatic.

The findings of general urine examination and vaginal swabs showed that pus cells were highest (93.4%), followed by R.B.C. (19.7%) and monilia (8.2%) (table 5).

Comparison between the efficacy of metronidazole and secnizole is indicated in table (6). It was shown that the efficacy of secnizole was greater than metronidazole, as the response rate in secnizole was (89.7%) but in metronidazole it was (69.2%), in addition to that the rate of *Trichomonas vaginalis* positive cases after treatment with metronidazole was (30.8%) which was significantly higher than in cases treated with secnizole (10.3%), (p<0.05).

Age (year)	No. examined	No. positive	% positive
11-20	16	4	25 %
21-30	131	41	31.3 %
31-40	48	14	29.2 %
41-50	15	2	13.3 %
Total	210	61	29.05%

$\chi^2 = 4.85$ d.f = 3 p > 0.05

Table (1) Distribution of Trichomonas vaginalis among women according to age in Kirkuk city.

pregnancy	No. examined	No. positive	% positive
Pregnant	47	20	42.55%
Not pregnant	163	41	25.15%

$\chi^2 = 5.35$ d.f = p < 0.05

Table (2) Distribution of Trichomonas vaginalis among women according to pregnancy .

Trimester	No. examined	No. positive	% positive
First	6	1	16.66%
Second	29	12	41.37 %
Third	12	7	58.33%
Total	47	20	50.6 %

$\chi^2 = 2.66$ d.f =2 p > 0.05

Table (3) Distribution of *Trichomonas vaginalis* among pregnant women according to trimester.

Clinical symptoms	Number	Percentage %
Vaginal discharge	37	60.6%
Itching	28	45.9%
Dysuria	11	18%
Dyspareunia	5	8.2%
Asymptomatic	9	14.7%
Total	90	

* Some patients report more than one symptom

Table (4) The clinical symptoms associated with Trichomonas vaginalis positive cases

Lab. finding	Number	Positive %
Pus cell	57	93.4%
R.B.C.	12	19.7%
Monilia	5	8.2%
Bacteria	2	3.3%
Total	76	

* Some patients have more than one lab. Finding

Table (5) Laboratory findings in urine and vaginal swabs of Trichomonas vaginalis positive cases

Drug	No. Treated	Responsive		Non responsive	
		No.	%	No.	%
Metronidazole	26	19	37.07%	7	30.8%
Secnizole	29	26	89.7%	3	10.3%
Total	55	44	80%	11	20%

$\chi^2 = 4.01$ d.f = 1 p < 0.05

Table (6) Comparison between the efficacy of metronidazole and secnizole in the treatment of Trichomonas vaginalis in women

DISCUSSION: -

The rate of *Trichomonas vaginalis* infection in this study is (29.05%). It is higher in comparison with other studies done in Iraq. In Kirkuk, Kadir and Gergis in 1995 [11] reported the prevalence of infection (7.5%) while Kadir and Kadir [12] reported (4.3%). The variation in the results might be due to difference in sample size and selection of patients examined and type of detection method (culture, direct), as sensitivity is varied according to the method used for detection of *Trichomonas vaginalis*.

Comparing the result of this study with that reported in other parts of the country, in Baghdad the prevalence of infection was varied from(13.6 - 19.5%) [7,8]; in Mosul (12.48%) [13] and in Erbil 10% [14]. However, the distribution of infection is much lower than that reported from some western countries [10].In Britain the incidence was (32%) among women in general and (46.9%) among those with vaginal discharge[15]. It was also shown that the infection rate was (70%) among drug addicts and prostitutes [16], while in Austria the incidence was (56%) among licenced prostitutes [17] . This could be attributed to good hygiene and sanitary habits especially by Muslims, also to the multipartner relationship in western countries which gives chance of spreading the disease in these countries.

The highest rate of infection was among women from (21-40) years old. This is in agreement with finding of Kadir and Gergis [9] in Kirkuk who found the patients mostly infected by *Trichomonas vaginalis* were at (16-40) years old; and Al-Mudhaffer in Baghdad [18] who showed that the highest rate of infection (10.7%) among women (20-40) years old and with Al-Najjar in Baghdad [7] who detected the highest rate of infection in women among the age group (26-30) years, but it is against the study done by Omer on Sudanese women, he reported the highest infection rate among teenagers (14-19) years old [12].

The high rate of infection among pregnant women (42.55%) might be related to high oestrogen level associated with pregnancy providing a favorable environment for the infection, this was attributed to the hypertrophy and hyperplasia of vaginal and cervical epithelium, and to high glycogen level in vagina which enhance the growth of parasite.

The highest rate of infection was reported among pregnant women in third trimester (58.33%) followed by second (41.37%) and first (16.66%). This highest rate of infection in third trimester of pregnancy is reported by Gergis and Kadir [11].

The clinical symptoms associated with *Trichomonas vaginalis* were vaginal discharge, itching, dysuria and dyspareunia, this is typical to

that reported in Kirkuk [11]. As 9 (14.7%) of cases were asymptomatic, it is worthwhile to investigate women without clinical symptoms for *Trichomonas vaginalis* infection.

In urine and vaginal swab examinations, in addition to pus cells, R.B.C., Monilia was detected in 5 (8.2%) of *Trichomonas vaginalis* positive cases. Monilia was also seen among positive cases by Kadir and Kadir [12] and Kadir and Aziz [19]. Al-Najar [7] found that there was no correlation between the isolation of *Trichomonas vaginalis* and infection with Monilia.

The positive *Trichomonas vaginalis* patients 61 (20 pregnant and 41 non pregnant) patients were divided into two groups, first group included (31) women with their partners, were treated with metronidazole tablets 250 mg three times daily for 7 days, (5) couples were excluded from the study because of failure of follow up and the remaining (26) patients (69.2%) of them responded to the treatment, while (8) patients (30.8%) were still positive for *Trichomonas vaginalis* . The second group included (30) patients and their partners, were treated with secnizole tablets 2gm as a single dose with the meal. One couple was excluded from the study because of failure of follow up. We used this drug in our study because of its long duration of action and consequently easy administration which was effective in eradication of *Trichomonas vaginalis* from 26 (89.7%) patients, while 3 (10.3%) patients were still harboring the parasite after completion of the treatment. The comparison between the efficacy of metronidazole and secnizole was statistically significant.

The presence of positive cases after completion of treatment in both groups may be due to incomplete therapy, reinfection or presence of resistant cases. Resistance against metronidazole is frequently reported and cross-resistance among 5-nitroimidazole drugs is common. Repeated administration of low doses of metronidazole may prolong therapy time of *Trichomonas vaginalis* infection, while application of high doses (over 3 gm /day) may result in undesirable complications.

Factors affecting efficacy of metronidazole such as drug concentration in situ, associated microorganisms that modify the amount of drug available in situ. *Trichomonas vaginalis* resistance to metronidazole is higher in patients with polyinfection in relation to those with monoinfection [9,20,21].

It is recommended to use other alternative drugs such as the broad-spectrum anti-parasitic drug nitrazoxanide and nalidixic acid [7] in addition to secnizole which was used in the present study.

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