

Abuse of contraceptive pills for long time may initiate urinary tract infection.

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Abstract:

49 urine samples taken from female having (UTI) and taking oral contraception pill for long time, samples were collected and divided into: (23) sample from women taking contraception more than one year and having inflammation, (15) urine sample from women taking contraception less than one year and having inflammation and (11) sample from women taking contraception for one month.

These patient divided into age groups:

- (20-30) years (this group include 17 (100%) patient and result show that 9 (53 %) of patient show no infection and only 8 (47 %) of patients show infection.
- (30-40) years (this group include 17 (100%) patient and result show that 8 (47 %) show no infection and 9 (53 %) show infection.
- (40-50) years (this group include 15 (100%) patient and result show that 7 (47 %) show no infection and 8 (53 %) show infection. The results of this study showed a significant infection occur among the women with age of more than 30 years and infection in women with age less than 30 years occur to lesser extent. so that this result given us an indication of that prolong use of oral contraceptive pill may contribute to the increase risk of UTI and infection was appear to be occur in women with age of >30 years. various hormones can affected by Birth control pills and disrupt hormonal regulations. the estrogen level may reduce dramatically by some birth control pills, then cause vaginal abrasion which leading to dryness increase, damaging tissue and irritation. researchers suggested that the birth control should don't taking by women with yeast and UTI chronic infection .

Keyword : contraceptive pills, duration of time, women, urinary tract infection.

الخلاصة:

التهابات المسالك البولية: تحدث عادة عندما تدخل البكتيريا المسالك البولية من خلال مجرى البول وتبدأ في التكاثر في المثانة. على الرغم من أن الجهاز البولي مصمم للحفاظ على مثل هذه الغزاة المهجرية، هذه الدفاعات تفشل في بعض الأحيان. عندما يحدث ذلك، قد البكتيريا تأخذ الانتظار وتنمو لتصبح عدوى كاملة في الجهاز البولي. التهابات المسالك البولية شائعة لدى النساء، والعديد من النساء يتعرضن لأكثر من عدوى واحدة خلال حياتهن. واحدة من عوامل الخطر المحددة للنساء لالتهاب المسالك البولية وتشمل أنواع معينة من الأدوية المستخدمة في منع الحمل من قبل النساء. النساء اللواتي يستخدمن وسائل منع الحمل لفترات طويلة عن طريق الفم قد يصبحن أكثر عرضة للخطر.

ولتحقيق العلاقة بين عدوى المسالك البولية ووسائل منع الحمل، أجري مسح مقارن لطرق منع الحمل عن طريق الفم وعدوى المسالك البولية بين الشابات اللواتي لم يتم تأكيد إصابتهن بالتهاب المسالك البولية وكذلك مع النساء اللاتي مصابات بالتهاب المسالك البولية. كانت هناك علاقة إحصائية ذات دلالة إحصائية بين استخدام وسائل منع الحمل عن طريق الفم من قبل النساء و التهاب المسالك البولية. النتيجة تظهر هناك حالات كبيرة من العدوى تظهر في النساء من الفئة العمرية أكثر من 30 عاما. وهذا يدل على وسائل منع الحمل عن طريق الفم تسهم في زيادة خطر التهاب المسالك البولية وخاصة في النساء اللواتي تزيد أعمارهن عن 30 سنة في حالة استخدام حبوب منع الحمل لفترات طويلة. المفاتيح : حبوب منع الحمل , التهاب المجاري البولية , النساء.

1. Introduction:

Urinary tract infection (UTI) is the microbial invasion of any tissue of the urinary tract, extending from the urethra to the kidneys, in which bacteria are established and multiplying within the urinary tract⁽¹⁾. the risk of serious infection in the kidneys minimize by urinary system. So that kidney preventing the urine from flowing back up into the kidneys. The bladder is only affected by majority of urinary infections, while symptoms, are not life threatening.⁽²⁾

researches classified the UTI according to signs and symptoms, laboratory findings, and type of the microbiological invasion. It is usually divided into acute uncomplicated UTI ,asymptomatic bacteriuria, , complicated UTI and recurrent UTI, ⁽³⁾. But most UTIs are uncomplicated.

Asymptomatic bacteriuria:

Some of nonpathogenic bacteria, have the ability to growing in urine. The presence of bacteria is common in asymptomatic persons, Attributed to a commensal colonization. However in this condition the bacterial growth is low and the patient is symptom free.⁽⁴⁾

Acute uncomplicated UTI:

mostly UTIs are seen in women without relevant structural, and functional abnormalities within the urinary tract. This type is usually associated with the following clinical features; Dysuria, urgency, frequency and suprapubic pain⁽⁵⁾.

Complicated UTI:

A complicated UTI can be defined by the infection complicated with a structural or functional disorder of the urinary tract, or, with presence of an underlying disease or other risk factors that increase the incidence of complication or possibility of Treatment failure if associated with UTI in patients who are haven't risk factors.⁽³⁾

Escherichia coli and Staphylococcus saprophyticus account for most of urinary infections (UTI). ⁽⁶⁾ However the bacterial growing in complicated UTI. Is bigger than uncomplicated UTI and this spectrum include ; (E coli , Candida spp , Enterococcus spp, Pseudomonas aeruginosa and Klebsiella spp.

There are other species including Enterobacter spp, Proteus spp, coagulase-negative staphylococci , Morganella spp and Acinetobacter spp) .⁽⁷⁾ also these patients show higher resistance to antimicrobials and antibiotics and higher incidence of Therapy failure if the underlying risk not corrected. ⁽⁷⁾

Recurrent UTIs are common among young healthy women, even though they have anatomically and physiologically normal urinary tracts with no structural and functional abnormality ⁽⁸⁾. It is suggested that the treatment strategy based on the clinical severity stage, and both convenient antimicrobial drug and treating or Disturb of risk factors ⁽³⁾.

However UTI can also be classified according to the site of the infection in the urinary tract including; urethritis(infection of the urethra), cystitis(infection of the bladder) and pyelonephritis(infection of the kidney).⁽²⁾

Risk factors for UTI in women:

Women are more likely to be infected with UTI than men according to the anatomy of female. The cause that the bacteria travel to the bladder in short distance, that is, the woman has a shorter urethra than a man. Also the women with sexual activity are more exposed to UTI . a decline in circulating estrogen after menopause, causes changes in the urinary tract leading to make those women more likely to be infected. The urinary tract abnormalities (congenital abnormalities of the urinary system) and blockage (such as presence of calculi or cysts or even tumors in the urinary system) are suggested other risk factors for UTI. suppressed immune system (which occur mostly in people with uncontrolled diabetes mellitus) and catheter use with risk of contamination in patients unable to empty their own bladder .⁽⁶⁾

In fact UTI does not always occur by introducing bacteria into the urinary system because the body has many defense mechanisms such as the normal urination process which wash out the harmful bacteria out of the body, also In healthy women, the vagina is colonized by lactobacilli, beneficial microorganisms that maintain a highly acidic environment (low pH). hydrogen peroxide is produced by Lactobacilli, that, helps eliminate bacteria and reduces the ability of Escherichia coli (E. coli), to adhere to vaginal cells. ⁽⁹⁾

Signs and symptoms of UTI:

UTIs is painful and uncomfortable, but usually pass, within a few days. diagnosed of Urinary tract infection, based on symptoms and testing of a urine sample. Actually UTI is one of the most common infections around the world.

Common signs and symptoms include:

- Burning sensation during urination.
- A frequent or intense urge to urinate.
- Pain or pressure in the patient back or lower abdomen.
- Cloudy, dark color , bloody, or abnormal-smelling urine.
- Feeling tiredness or fatigue.
- Fever or chills .⁽⁹⁾

UTIs treated in normal case, easily and quickly and don't have severe complications. In The few class, however, Complications can occur when untreated UTI then It causes chronic infection and injuries. Complications include recurrent UTI and renal scarring .

Recurrent UTI can occur after the primary infection even in the absence of functional abnormalities . These Return caused by same bacterial strain, suggesting incomplete healing of the primary infection, rather than, a new infection, this illustrate why some patients develop UTI In a big way in spite of the antibiotic therapy course.

Another complication include renal scarring. It is suggested that the bacteria may transport to the upper urinary tract If the immune response of host fails, then cause pyelonephritis. renal scarring (losing part of the renal function) caused by these inflammation. The Renal scarring is a process have many factors, including influx of neutrophils and some cytotoxic products such as lysosomes which cause damage to the renal tissue. Renal scarring is more common in congenital renal abnormalities.⁽¹⁰⁾

Treatment of UTI:

UTI are usually treated by antibiotics:

- First-line antibiotic: Trimethoprim/sulfamethoxazole .
- Second-line antibiotics or first-line in resistant communities: Fluor quinolones, such as ciprofloxacin, levofloxacin and norfloxacin.
- For symptomatic relief phenazopyridine use is recommended as urinary analgesic and antiseptic.⁽¹¹⁾

Contraceptives:

Contraception can be defined as a method that prevention of pregnancy, prevention occur by inhibiting the sperms from fertilizing a mature ovum, or preventing a fertilized ovum from implanting, in the endometrium by causing unfavorable environment in uterine.⁽¹²⁾

Oral contraceptive pills ,refers to birth control methods that act on the endocrine system. There are many types of oral contraceptives but most of them are combinations of synthetic estrogens and progestins, there are also pills which contain only progestins. These pills act by inhibiting female's ovulation by suppressing gonadotropins and making a negative feedback on the FSH and LH released by the anterior pituitary , contraceptives also change the cervical mucus to make it difficult for the sperm to go through the cervix and find an egg, also provide unfavorable environment for fertilization (making the female temporary infertile).⁽¹³⁾

Components of The oral contraceptive pills:

- Estrogens:

in contraceptives there are two types of estrogens. one more common category is ethinyl estradiol . oral contraceptives which contain mestranol is few, mestranol is metabolized by the liver, then convert to ethinyl estradiol, mestranol has half the potency of ethinyl estradiol. the important content of oral contraceptives is Estrogens, it is affect by prevent formation of a follicle. a negative feed loop is created between the hypothalamus and anterior pituitary when Estrogens given in a large amount that over the normal endogenous levels, leading to prevent the secretion of FSH from anterior pituitary. The decrease of FSH level cause failure of follicle formation and ovulation.⁽¹⁴⁾

Progestins:

the progestins can be divided into four generations . Progestins when used alone are more effective, also when combination with estrogens. progestins inhibit the LH surge when used in combination with estrogens , LH surge required for ovulation. progestins are not thought to consistently inhibit ovulation when used alone, because of the lower doses of progestins in (progestin only pills) when compared with a combination product . Progestin only pills are creating many changes: a hostile cervical environment (thickening of the mucous and cause endometrial atrophy) , leading to decrease the penetration of sperms and inhibit egg implantation. Each type of progestins have different affinities for estrogen , androgen and progesterone receptors and have various side effects.⁽¹⁴⁾ progestin only pills(POP) or mini pills, Prepare an oral alternative method for lactating women because progestins unlike combinations Do not cause decrease milk production. POP is also a good option for with contraindications or intolerance to estrogens containing preparations and women who desire to be pregnant ,

because POP do not stop ovulation ⁽¹⁴⁾. POP must taken regularly with no pill free interval because its efficacy decrease after 22 hr of the dose intake. ⁽¹⁴⁾

The effectiveness of oral contraceptives with perfect use (the pill is taken eve day at the same time) is 99% , studies show that the efficacy have been reduced to 95% due to the patient noncompliance and inappropriate use . ⁽¹⁴⁾ estrogen dose were lowered, after reports which suggested increased risks of ischemic stroke , myocardial infarction, and pulmonary embolism, because of contraceptive efficacy has not affected with using lower doses of formulations The Dose continued to decrease ⁽¹⁴⁾. A common example of a combination oral contraceptive is (ethinyl estradiol /drospirenone) Yasmin, it is an oral contraceptive monophasic , that is Featured in that: it's progestin which similar to spironolactone in structur . Each tablet contain 30mcg of (ethinyl estradiol) and 3 mcg of (drospirenone), which is Rewards to 25 mcg spironolactone. Because of the weak potassium sparing diuretic effect of drospirenone, this product may be preffered by woman, who Suffer from water retention associated with their menstruation .

How to use oral contraceptive pills:

The woman who doesn't desire to become pregnant can take the pill anytime in her menstrual cycle if she is sure from no presence of pregnancy.

The patient can take the pill in her first day of her menstrual cycle so she would be protected from pregnancy immediately. Also there is another way by starting taking the pill on the fifth day of the menstrual cycle so she would be protected from pregnancy. The pill must be taken every day at the same time(accurate timing is important),but in case of miss dosing before 12 hr the patient should take 2 pills and continue the therapy but if intercourse had happened should check for pregnancy , so in case of no pregnancy should take 2 pills and continue the therapy. ⁽¹⁵⁾

Side effects and risks of using oral contraceptive pills:

However these pills have many side effects and risks such as high risks of blood clotting which may lead to the venous thromboembolism (VTE) ,heart attack or stroke. The side effects also include: weight gain or fluid retention,breast tenderness and depression ⁽¹⁷⁾ ,etc... Also the oral contraceptive pills on prolong use highly increase the risk of breast cancer ,ovarian cancer and endometrial cancer. A majority of the risks are usually associated with combined products because progestin only pills are not Linked with cardiovascular complications Observation with estrogen use therefore POP are Appropriate alternatives for woman at risk of negative effects or contraindications to estrogens. ⁽¹⁴⁾

Table -1: management of some adverse effects of oral contraceptive pills. ⁽¹⁸⁾

Problem	Management strategies based on practice
Nausea	Reduce oestrogen dose Exclude pregnancy Take pills at night Change to progestogen-only method
Breast tenderness	Reduce oestrogen and/or progestogen dose Change progestogen Consider using a pill containing drospirenone
Bloating and fluid retention	Reduce oestrogen dose Change to progestogen with mild diuretic effect (i.e. drospirenone)
Headache	Reduce oestrogen dose and/or change progestogen If headache occurs in hormone-free week, consider: <ul style="list-style-type: none"> • extended use or • giving oestradiol 50 microgram transdermal patch in this week or • try oestradiol valerate/dienogest pill[®]
Dysmenorrhoea	Extended pill regimen to reduce the frequency of bleeding
Decreased libido	No evidence supports a benefit of one type of oral contraceptive pill over another
Breakthrough bleeding	If taking an ethinylloestradiol 20 microgram pill, increase oestrogen dose to a maximum of 35 microgram Change progestogen if already taking an ethinylloestradiol 30–35 microgram pill Try another form of contraception. Consider the vaginal ring.

Advantages of Oral contraceptive pills:

On the other hand these pills have many advantages over other methods of contraception. These pills have 99% effectiveness with very low risk of pregnancy, regulate the menstrual cycle of the women especially those with irregular one, prevent ectopic pregnancy and also help preventing osteoporosis.⁽¹⁹⁾ Also oral contraceptives decrease the risk of dysmenorrhea, anemia and ovarian cysts.⁽²⁰⁾

However the Positives and risks should be estimated on individual according to identify high risk patients then avoided the adverse effects.⁽²¹⁾

Material and methods:

- Specimen collection:

49 samples urine taken from female having (UTI) and taking oral contraception pill for long time were collected and divided into:

- 23 urine sample from women taking contraception more than one year and having infection.
- 15 urine sample from women taking contraception less than one year and having infection.
- 11 urine sample from women taking contraception for one month.

The age groups of the patients were :

- (20-30) years (this group include 17 (100%) patient and result show that 9 (53 %) of patient show no infection and only 8 (47 %) of patients show infection.
- (30-40) years (this group include 17 (100%) patient and result show that 8 (47 %) show no infection and 9 (53 %) show infection.
- (40-50) years (this group include 15 (100%) patient and result show that 7 (47 %) show no

infection and 8 (53 %) show infection.

- Urine specimen collection:

Proper collection of urine specimen is the most important step in urine culture ,and prevention contamination is most important consideration for collection of urine sample. Midstream urine sample from 49 patients were examined bacteriologically. These sample were collected from patient visiting urology department in Al-Hussainy hospital in Karbala. Midstream urine sample were collected in cleaned screw capped test tube and then package test tubes within closed container containing ice to prevent spoiling of the samples during the transport of sample to laboratory.

- Identification of isolate:

A-culture characteristic:

Each microorganism was identified either macroscopically or microscopically or by using biochemical test for example E-coli, staphylococcus and streptococcus⁽²⁴⁾.

B-biochemical test:

Such test use to differentiate staphylococcus from streptococcus for example (catalase test) microorganisms that live in oxygenated environments produced Catalase enzyme, to neutralize toxic forms of oxygen metabolites; H₂O₂. catalase enzyme neutralizes the bactericidal effects, of hydrogen peroxide, and protects them. catalase enzyme lack by Anaerobes . to distinguish among Gram-positive cocci catalase test is use : (members of the genus Staphylococcus are: catalase-positive, and members of the genera Streptococcus and Enterococcus are: catalase-negative).⁽²⁵⁾

Also can use another biochemical test for differentiate gram positive from gram negative bacteria for example KOH test⁽²⁶⁾.

For another microorganism like acinetobacter the (API20E) were perform by using strip test.⁽²⁷⁾



Figure-1 : This figure show (API20E) use for acinetobacter identification.

Results:

The distribution of age groups for patients taking contraceptive pills in this study showed that the highest percentage was 34.7% in both groups (20-30 and 30-40), while the lowest percentage 30.6% was in (40-50) group (table-1, figure-2 and figure-3).

Table (1): distribution of patients according to age groups.

Age groups	Frequency	Percent	Percent	Cumulative Percent
20-30	17	34.7	34.7	34.7
30-40	17	34.7	34.7	69.4
40-50	15	30.6	30.6	100.0
Total	49	100.0	100.0	

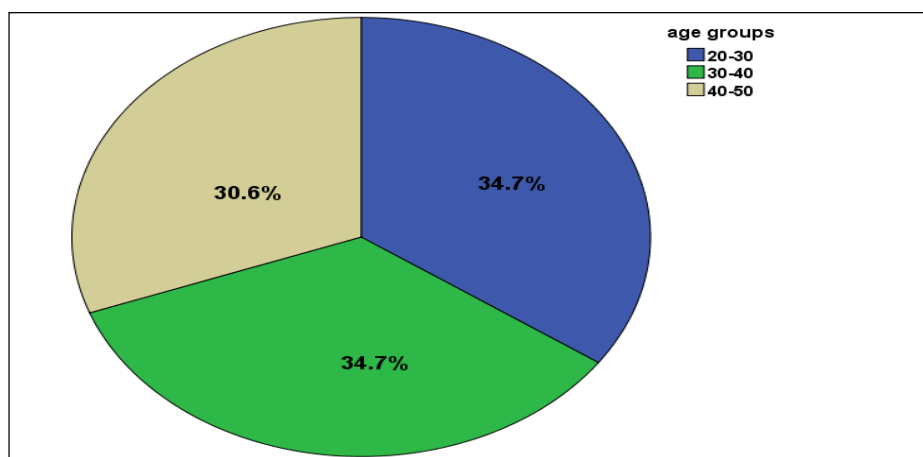


Figure (1): distribution of patients according to age groups.

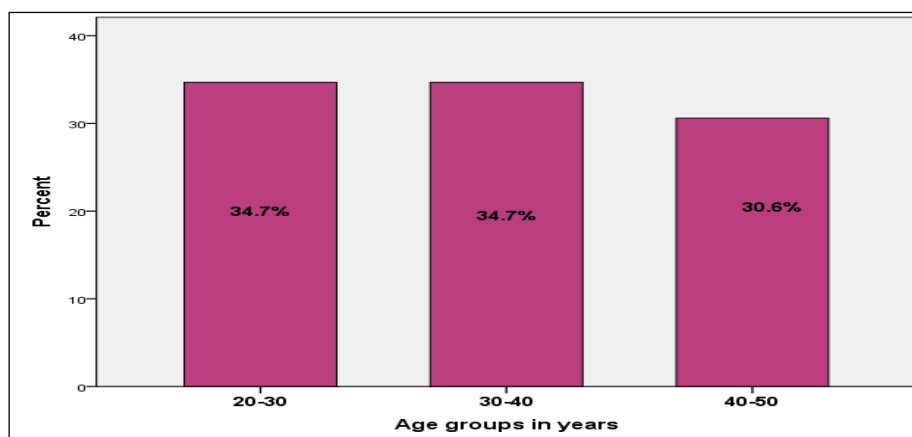


Figure (2): distribution of patients according to age groups

The time duration of patients administrating contraceptive pills showed that the highest percentage was 46.9% in patients using pills for (1-1.6 year), compared to 30.6% in patients

using pills for (5-8 month), while the lowest percentage of patients was 22.4% for those who used pills for (1month) (table-2 and figure-4)

Table (2): distribution of patients according to duration of pills admin.

duration of pills admin	Frequency	Percent	Valid Percent	Cumulative Percent
(1-1.6y)	23	46.9	46.9	46.9
(5-8 m)	15	30.6	30.6	77.6
(1 m)	11	22.4	22.4	100.0
Total	49	100.0	100.0	

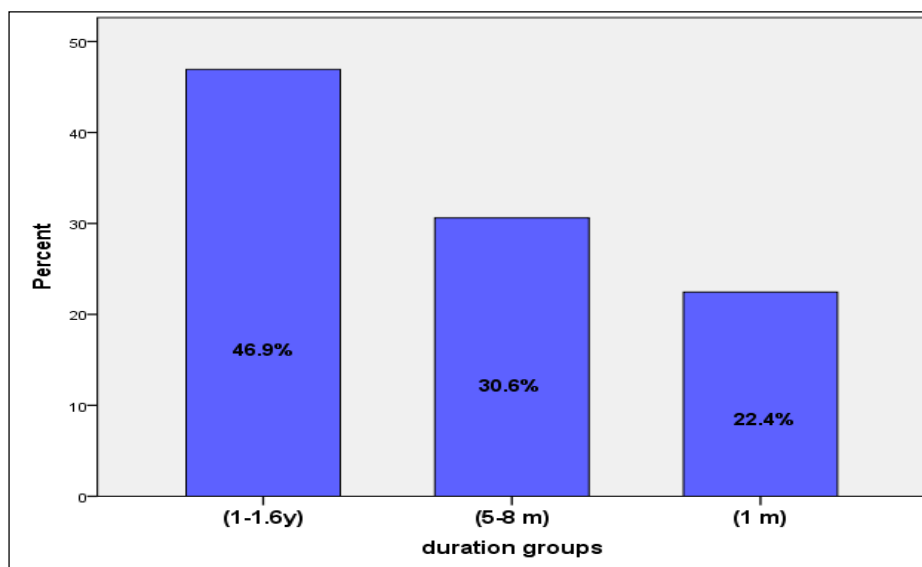


Figure (3): distribution of patients according to duration of pills admin.

The frequency of having UTIs in women taking contraceptive pills was studied in this research and the results illustrated that the highest percentage 51% of patients have infection with UTI (yes), compared to 49% of patients with no infection (no) (table-3 and figure-5).

Table (3): distribution of patients according to infection with UTI.

	Frequency	Percent	Percent	Cumulative Percent
No	24	49.0	49.0	49.0
Yes	25	51.0	51.0	100.0
Total	49	100.0	100.0	

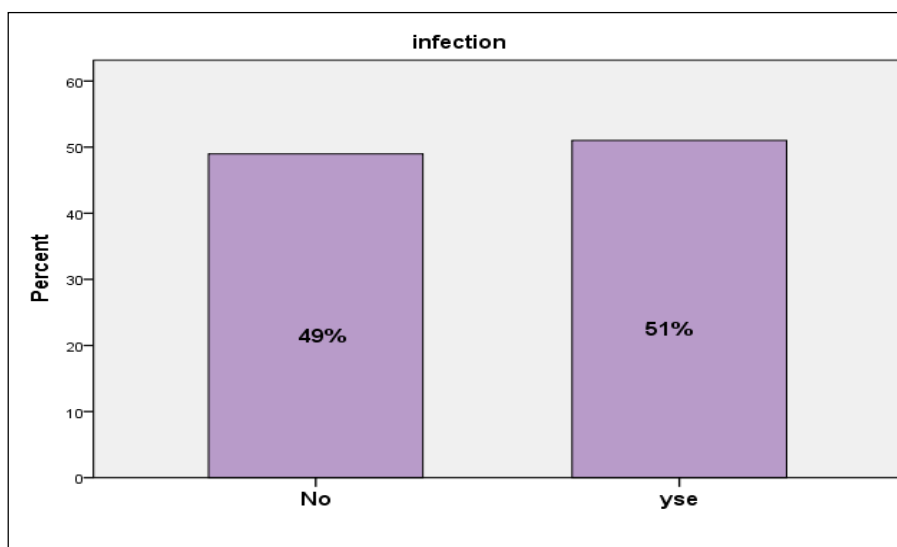


Figure (4): distribution of patients according to infection with UTIs.

The relationship between duration of pills administration and infection was also studied and the results showed that the duration of (1-1.6y) have the highest ratio of infection on the cumulative level of the statistical program (table-4 and figure-6).

Table (4): Relationship between duration of pills administration and infection with UTI.

duration of pills admin	Infection		Total
	No	Yes	
(1-1.6y)	11	12	23
(5-8 m)	7	8	15
(1 m)	6	5	11
Total	24	25	49

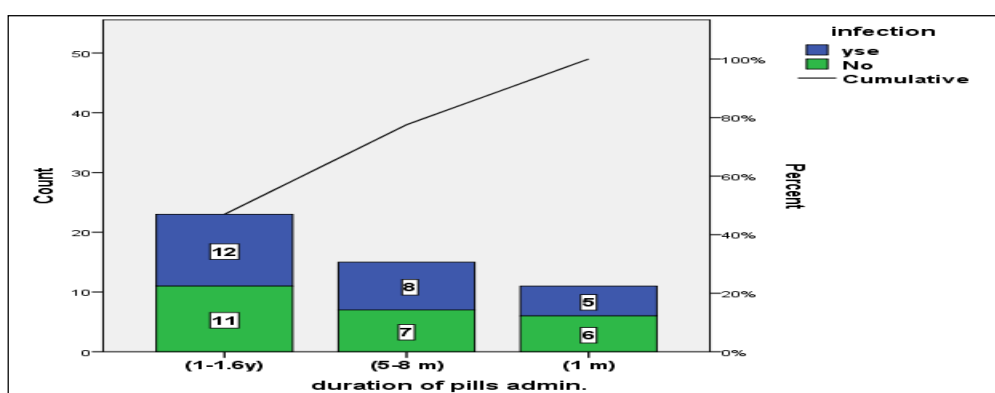


Figure (5): relationship between duration of pills administration and infection with UTIs.

Table-5 and figure-7 concluded that there is no relationship between age groups and infection on the cumulative level of the statistical program.

Table (5): Relationship between age groups and infection with UTI.

Age groups	Infection		Total
	No	Yes	
20-30	9	8	17
30-40	8	9	17
40-50	7	8	15
Total	24	25	49

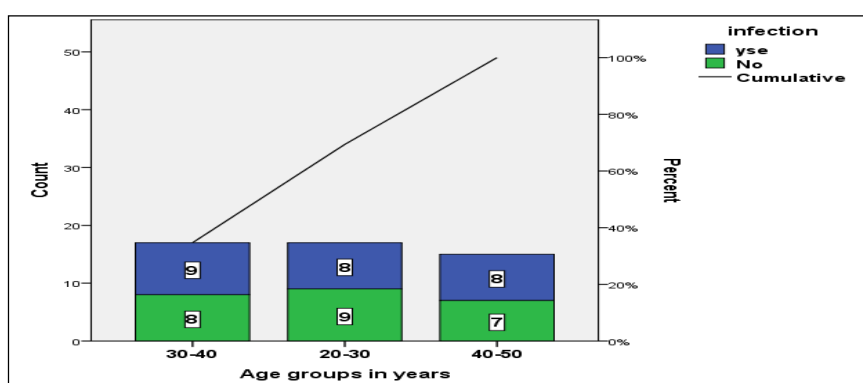


Figure (6): relationship between age groups and infection with UTI.

Discussion:

The research deal with the study the relationship between the using of oral contraception pill by women for birthing control and the urinary tract infection(UTI) disease . the research include the taking of urine sample from 53 women (17sample from women with UTIonly,11 sample from women taking contraceptive without UTI and 53 sample from women taking contraceptive and have UTI) ,cultured sample and then examination for bacteria growth if happen or not . according to Anna Treinkman, (a nurse practitioner at the Rush Alzheimer's Disease Center in Chicago), she said If a 30-year-old woman felt burning with painful during urinates, then she must be has a urinary tract infection, also an elderly urinary tract infection causes similar symptoms, with out pain or discomfort. The older immune response changes consider normal aging, and this compatible with our result as result of our work show that

there is significant infection occur among the women with age of more than 30years and infection in women with age less than 30 years occur to lesser extent.so that this result given us an indication of that oral contraceptive pill may contribute to the increase risk of UTI and infection was appear to be occur in women with age of >30 years, so that we are need to know how pill of birth control causing UTI .however, the estrogen and progesterone contribute to protect of urinary tract from infection ,we can understand that if we know the mechanism by which this hormones would be act⁽²⁸⁾

One of the most important female hormone is estrogen and according to the study published by Curran et al.1980. the subject of many studies is the estrogen associated with the risk of urinary- tract infection in women, in both experimental animals and human. these studies have Opposite results so that, some studies suggested that is increased risk caused by estrogen, but others studies show that estrogens may be preventative , this contradiction occur because of the physiological effects of estrogen, on different anatomic regions of the urinary tract differ, according to the specific effect and the result It was measured. and this compatible with our result, the changes to a flora with few lactobacilli but many E. coli which is compatible with our result⁽²⁹⁾ This change in flora is liked with increased risk of Always repeated (E. coli) bladder infections and this compatible with our result.. Progesterone have several roles in preventing the infection of vaginal and urinary tract, which is similar to our result. Most often forget that the both estrogen and progesterone help each other. The cells need to Estrogen to make progesterone receptors, then progesterone helps make estrogen receptors, it more sensitive. When there is deficient in progesterone the estrogen receptors become less sensitive to estrogen. For this reason, many women which suffer from estrogen however, they have signs of estrogen deficiency, such as vaginal dryness and hot flashes, also, estrogen dominance symptoms. so that, progesterone (which is important female hormone), estrogen receptors become more sensitive when progesterone Returns to normal levels, and signs of estrogen deficiency Expires like hot flashes vanish, vaginal lubrication reinstate, and urinary tract problems finish.⁽²⁹⁾

It should always be mentioned that progesterone is important part of immune defense system, also progesterone contribute in the formation of important immune globulin secretory (IgA), it is function Catching the germs before they Cross mucosal tissues, like those found in the vagina. For this reason women which using progesterone cream, have allergies and sinusitis. Must be supplement with normal physiological doses of progesterone To improve effectiveness of immune defenses. various hormones can affected by Birth control pills and disrupt hormonal regulations. Researches suggested that estrogen level reduced by some of (birth

control pills). Estrogen keep vaginal tissue more healthy, by preserving the normal vaginal lubrication, and acidity and tissue elasticity. if estrogen levels decrease, the vaginal Scratch and increase the dryness, then tissue damaging and women irritation occur⁽³⁰⁾. It is suggested that the enzymes prostaglandin E1 and E3 suppress by most birth control pills, so that urethral tract, vaginal canal, cervix become easily irritated. if the immune systems of urethral or bladder are suppressed, then UTI will be occurs. The Suppressed immune systems influx of the inflammatory hormone (prostaglandin E2), which running UTI, and this compatible with our result.

often chronic UTI and yeast infections see in Women who take birth control pills, this similar to our result. Antibiotics may cause the Calm pain, but too much consumption of birth control pills cause the problem to return, and this compatible with our result⁽³⁰⁾

So that Women should avoided taking birth control, if they have chronic (UTI) and yeast infection problems, for a few weeks. also, women may use (Vaginal Infection Relief & Detoxification drug) for decrease the prostaglandin E2 production.⁽³¹⁾

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