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The Role of *Kocuria Rosea* in Men Infertility

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ABSTRACT: This study was aimed to determine the role of *Kocuria rosea* in men infertility in Maysan . Was collection 80 sample of semen in men infertility of reviewers to clinics and laboratory own in Maysan of 2025/6/1 to 2026/1/15 . Culture all samples on the cultures medium MacConkey agar , Blood agar, Chocolate agar and within the 80 sample recorded bacteria *Kocuria rosea* in 14infections and rate 17.5% patient and was diagnosed technology system Vitek 2 Double . recorded this the study the highest presence of bacteria in category the age 30-39 by 64% . In this study appeared percentage infertility primary in the rate of 94% as register presence of *Kocuria rosea* among the 14 infection 11 infection by 79%. case infected of bacteria either for the inf *Kocuria rosea* ertility secondary sign 6% recorded of *Kocuria rosea* include 3 cases. Also been diagnosed other bacteria of an *Kocuria rosea* but the ratio biggest were to the *Kocuria rosea*. Was *Escherichia coli* and *Enterobacter cloacae* in 7 infections and rate 8.7% , Also diagnosed all of *Klebsiella pneumoniae* and *Pseudomonas aeruginosa* in 6 infections and rate 7.5%. *Enterococcus faecium* 4 infections and rate 5% . Finally presence of *Morganella morganii* in 2 infections and rate 2.5%. The infertile men positive for *Kocuria rosea* had semen samples that showed statistically significant differences in mean of semen ($P<0.05$).

INTRODUCTION:

Infertility it means the inability to have a child after at least 12 months of unprotected sexual intercourse without using any contraceptive or condom use and affect the cause psychological and social of both spouses(Deka and Sarma , 2010). The incidence of male infertility means of a problem in the genital tract lead to an imbalance and lack of fertility (Askinazy-Elbhar,2005). *Kocuria rosea* is a member of the coagulase – negative (Bertin et al.,2004).It is a well- known opportunistic bacterial pathogen that is well-known for its highly antibiotic- resistant phenotype (Takeuchi et al .,2005).As a gram- positive *Kocuria rosea* has a thick peptidoglycan wall outside (Billot- Klein et al .,1996). And it is highly cross- linked and reported cases of infections caused by *Kocuria rosea* dysfunction of organ systems resulting from immune response to a severe infection(Takeuchi, 2005). Primary infertility is infertility which affects the woman or man since the beginning of their lives of marital sexual and caused either hormonal or not integration organisms sexual for caused congenital (La vignera , et al .,2012).As for infertility secondary it is the infertility that afflicts woman after having a child or having a pregnancy end abortion child or ectopic pregnancy resulting from bleeding after birth or when the female is in a period of breastfeeding or because of the presence of infections resulting from bacteria . Men infertility occurs due to the inactivity of sperms and their inability to penetrate the membranes of the egg(Kay and Robertson , 1998).

Materials and Methods:

This study included the collection of semen (100) a married men infected infertility aged (20-59 year) 80 infertile men and 20 fertile men is considred control by collecting samples in sterile plastic (cup at the hospital) according to the instructions of where to abstain from ejaculation for at least 48 hours before a routine examination of a sample of semen and then placed in the incubator for 20 minutes at least by converting it from a glass to the transparent liquid may be more than one hour if the

high viscosity . Included measurements of volume sperm count and movement of sperms and type of sperms been collecting samples from reviewers to clinics and laboratories in Maysan - Iraq. As well culture all samples on media (Blood , Chocolate , MacConkey agar) and it was diagnosed by Vitek 2 system. Rapid identification (three hrs) , a high level of automation , a simple methodology and taxonomically updated databases (Cheng et al., 2010). All men were instructed to abstain from sexual intercourse or masturbation for 5 days before attending the clinic. Upon arrival at the clinic the men were asked to collect samples by masturbation on site into standard sterile containers known to be free of cytotoxic effects on human spermatozoa (WHO, 2010). Before semen collection the men were asked to wash their hands and genitalia with running water and soap. Soon after semen production the samples were promptly liquefied at 37 °C for about 30 minutes in an incubator before analysis . Finally , samples were subjected to semen analysis as recommended by WHO (2010).

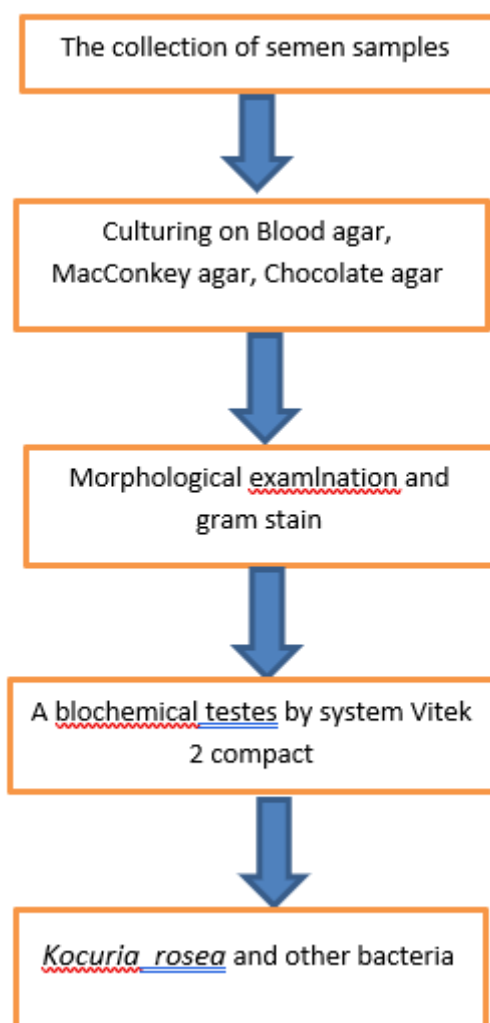


Figure (1) flow chart showing isolation and identification of *Kocuria rosea*

RESULTS:

The results of the current study showed that can isolated and diagnosis *Kocuria rosea* of semen by Vitek 2 system , From (80) samples of seminal fluid of infertile men who the reviewers to the clinics and the private laboratories in the province of Maysan. *Kocuria rosea* was diagnosed in (14) and the rate 17.5% patients. When analysis semen for patients which infected by this bacteria their effect appeared on the size and nature semen and as well on the number and efficiency of the tents the appearance of these bacteria also led to the appearance of abnormal sperm .Affected *Kocuria rosea* in quantity and quality of sperm. Colonies were appeared bacteria after (24-48) hours and have cocci shape as shown in the (2-4) figures .



Figure (2) colonies *Kocuria rosea* on the blood agar medium.



Figure (3) colonies *Kocuria rosea* on the chocolate agar medium.



Figure (4) colonies *Kocuria rosea* on the MacConkey agar medium.

The colonies were stained with gram stain and it appeared gram positive with purple color as shown in figure (5).

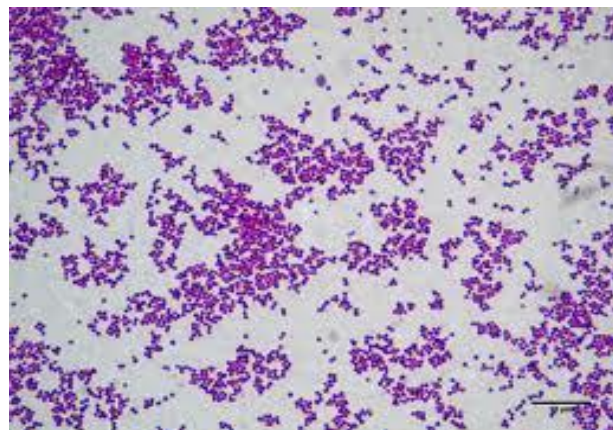


Figure (5) *Kocuria rosea* colonies stained gram stain (100X).

Seminal fluid analysis for infertile men which infected with *Kocuria rosea*, Many of bacterial isolates were isolated from patients , beside *Kocuria rosea* the study diagnosed *Enterobacter cloacae*, *Escherichia coli*, *Klebsiella pneumoniae*, *Kocuria rosea*, *Pseudomonas aeruginosa*, *Enterococcus faecium* and *Morganella morganii* (Table -1-).

Table (1) bacterial which isolated from patients.

Type of bacteria	Number	Percent
<i>Kocuria rosea</i>	14	17.5%
<i>Enterobacter cloacae</i> <i>Escherichia coli</i>	7	8.7%
<i>Klebsiella pneumoniae</i> <i>Pseudomonas aeruginosa</i>	6	7.5%
<i>Enterococcus faecium</i>	4	5%
<i>Morganella morganii</i>	2	4%

The volume was ranged between 1.5- 3 ml . The infection was affected on appearance of abnormal sperm with high numbers . On the type of sperms the infection was affected because type (A) sperms recorded low numbers in contract with of her types (B + C) also, type (D) sperms recorded low percent. (table 2).

As shown in the table (2) the infection with *Kocuria rosea* was affected infertile men .

	Count	Volume	Normal	Abnormal	A	B	C	D	RBC.	Pus
1	Azoospermia	1.5	5	95	5	0	95	0	1	0
2	10 ⁶ ×5	1.5	15	85	15	20	35	30	1	1
3	10 ⁶ ×6	1.5	20	80	15	30	20	20	1	1
4	10 ⁶ ×15	1.5	20	80	20	40	20	20	2	1
5	10 ⁶ ×65	1.5	20	80	20	25	35	20	2	1
6	10 ⁶ ×20	1.5	30	70	25	65	5	5	2	1
7	10 ⁶ ×20	1.5	35	65	30	30	10	30	2	1
8	10 ⁶ ×30	1.5	35	65	30	40	15	15	3	2
9	10 ⁶ ×35	1.5	25	75	40	20	15	25	4	2
10	10 ⁶ ×40	2.0	40	60	45	40	5	10	4	2
11	10 ⁶ ×60	2.0	20	80	45	30	15	10	5	2
12	10 ⁶ ×65	2.0	45	55	30	20	5	45	6	2
13	10 ⁶ ×80	2.0	40	60	45	35	10	10	6	2
14	10 ⁶ ×100	3.0	45	55	25	20	30	25	6	2

Type of infertility was determine in current study , Primary infertility percent was 94% while secondary infertility recorded only 6% . Among primary infertility cases a 79% found infected with *Kocuria rosea* and 21% in secondary infertility (table -3-)

Table (3) type of infertility of patients .

Infertility type	Rate
Primary infertility	94%
Secondary infertility	6%
Infertility type found <i>Kocuria rosea</i>	Rate
Primary infertility	79%
Secondary infertility	21%

Patients were divided in four age groups . The high percent (64%) recorded in patients with age group (30-39). (table -4-).

Table (4) age groups of study patients.

Age	Number	Rate
20-29	2	14%
30-39	9	64%
40-49	2	14%
50-59	1	7%

Table -5- explain the patients disease which recorded in this study beside infertility . A (4) patients have diabetes and (2) suffered with thyroid gland disease .

Table (5) type of patients diseases.

Sickness	Number	Rate
Diabetes	4	28%
Thyroid	2	14%

Patients wives of study participants have infection with bacteria a 93.7% percent. Distributed patients among residents the province center Maysan elimination and aspects , as recorded found *Kocuria rosea* in elimination and aspects more than the center of the civil, in elimination 9 infections rate 64.2% and in center 5 infections rate 35.7% as in the table (6) . And all medical examination showed statistically significant differences in mean of semen ($P < 0.05$).

Table (6) Distribution of patients areas.

Areas	Number	The rate
Center province	5	35,7%
Elimination	9	64,2%

DISCUSSION:

The role of the genital tract microorganisms important factor in male infertility (Keck et al., 1998 ; Ramesh et al.,2004)).In current study revealed highly significant of sperm quality in infertile men $P < (0.05)$. Bacteria is transmitted to the genital tract

of the urinary tract or from the digestive system due to the proximity of the opening device of the output of the reproductive system as it becomes opportunistic to pathogenic and caused infections in the epididymis prostate and semen and testicles and thus infertility (Alausa and Osoba, 1978; Hobson et al., 2013). More that presences bacteria in semen which cause infertility represented in total bacteria *Kocuria rosea* (Cunningham and Beagley, 2008; Fraczek et al., 2012). Identified the current study bacteria *Kocuria rosea* in the rate 17.5% the presence of these bacteria it works paralysis in sperm As it penetrates of sperm and break it excretion enzymes which on the occurrence of deformities (Veznik et al., 2004). In addition to the negative impact on the secretion of the gonads and its analysis of blood and appearance of RBC. and WBC. and agglutinating of sperm (Qusada et al., 1968; Alekwe et al., 2013). More bacteria are present in samples she *Kocuria rosea* and *Escherichia coli* in terms of influence on movement and morphology of sperm (Prabha et al., 2010). Also the presence of *Enterobacter cloacae* and *Pseudomonas aeruginosa* influenced in appearance shapes of abnormal and lack of movement (Merino et al., 1995; Buommino et al., 1999). It was appearance of *Klebsiella pneumoniae* and *Enterococcus faecium* and *Morganella morganii* role in infertility by influencing the movement, quantity and quality of sperm (Claire et al., 2013). That presence *Kocuria rosea* come through the proper environment for semen because it contains nutrients and this is basic basis in the presence of bacteria (Shalika et al., 1996).

Primary infertility occurs and secondary infertility by having bacteria causing adverse and adverse changes in sperms chromosomes thereby causing abnormal and abnormalities of sexual chromosomes represented chromosomes (Y) as the bacteria work to lose semen sperm (Samara et al., 2011). Infertility increased in age groups (30-39). It is companion to the presence of bacteria *Kocuria rosea* because as a defect in the function sex gland and the descent of abnormal secretions changed the characteristics of semen it is a period of sexual activity (Weng et al., 2014). Also recorded the current study accompanying bacteria with diabetes most people with diabetes suffer from cystitis which causes difficulty in dividing the bladder it is difficult to sweep the bacteria outside the body he added that high blood sugar is an appropriate environment for the presence of bacteria diabetes inhibits immunity which is caused by dysfunction in phagocytic cells (Jeanette et al., 2005). Thyroid diseases if caused by thyroid diseases lack of secretion of male hormone Testosterone (Paavonen, 1998). The current study was associated with infertility with the presence of bacteria in the districts more than the center of the city to raise health awareness (Lewis et al., 1981). 93.7% is the proportion of women infected with infections and because of sexual contract to infection or diseases in one of the spouses will move to the other partner and case to the diseases and thus infertility (Samara et al., 2011).

REFERENCES:

- [1] Alausa, K. and Osoba, A. (1978). The role of sexually transmitted diseases in male infertility in Tropical Africa . Niger. Med. J. 8: 225-229.
- [2] Alekw, A. Osamudiamen, I. and Aberare, L. (2013). Association between bacteriospermia and abnormal semen characteristics, Pak. J. F. Med. Heal. Sci. 7(1):3-6.
- [3] Askienazy – Elbhar. (2005) . Male genital tract infection : the point of view of the bacteriology . Gynecol. Obstet. Fertil. 33 (9) : 691-697.
- [4] Bertin , M. Muller, A. Bertrand , X. Cornette, C. Thouverez, M. and Talon, D. (2004). Relationship between glycopeptide use and decreased susceptibility to teicoplanin in isolation of coagulase – negative staphylococci . Eur . J. Clinmicrobiol infect Dis. 23 (5): 375-379
- [5] Billot – Klein , D. Gutmann, L. Bryant, D. Bell, D. Van Heijenoort, J. and Grewal, J. (1996). Peptidoglycan synthesis and structure in Staphylococcus haemolyticus expressing increasing levels of resistance to glycopeptide . J. Bacterial 187 (15): 4696-4703.
- [6] Buommino , E. et al.,(1999). Porin from Pseudomonas aeruginosa Induces Apoptosis in an Epithelial Cell Line Dervied from Rat Seminal Vesicles . Inf. Imm. 67: 4794-4800.
- [7] 7- Cheng, C. Wong, E. Yan, H. and Mruk, D. (2010). Regulation of spermatogenesis in the microenviroment of the seminiferous epithelium :new insights and advances.Mol Cell. Endocr . 315 (1-2):49-56.
- [8] Claire, B. David, G. and Hossein, S. (2013). Sexually Transmitted Infections and Sexual Function in Relation to Male Fertility Imperial College Healthcare NHS 3: 54-149.
- [9] Cunningham, K. and . Beagley, W.(2008). Male genital tract chlamydial infection : implications for pathology and infertility. Biol. Repro. 79(2):180-189.
- [10] Deka and S. Sarma .(2010). Psychological aspects of infertility. Briti. J. Med. Pract. 3(3) article a336. 40.

- [11] Fraczek M, Piasecka M. and Gaczarzewicz, D . et al.(2012). Membrane stability and mitochondrial activity of human – ejaculated spermatozoa during in vitro experimental infection with *Escherichia coli* , *Staphylococcus haemolyticus* and *Bacteroides ureolyticus* . *Andro*. 44:315-329.
- [12] Jeanette, S. Wessells, H. Chancellor, M. Howards, S. Stamm, W. VanDenEdenm , S. and Mc Vary, K. (2005)Urologic complications of diabetes. *Diabetes Care*. 28:177-185.
- [13] Hobson, N. Chousolkar, K. and Chenometh , P.(2013).*Ureaplasma* spp. In semen in Australia: its detection and potential effects . *Aus . Vet. J.*, 91(11):469-473.
- [14] Kay, V. and Robertson, L. (1998). Hyperactivated motility of human spermatozoa . a review of physiological function and application in assisted reproduction . *Hum. Rep. Upd.* (4).776-786.
- [15] Keck , C. Gerber – Schafer, C. Clad ,A. Wilhelm, C. and Breckwolf, M .(1998). Seminal tract infections : impact on male fertility and treatment options . *Hum. Reprod.* 8- Update , 4 (6): 891-903.
- [16] La Vignera , S. Condorelli , R- Vicari , E. Agata , R. and Calogero , A. (2012). High frequency of sexual dysfunction in patients with male accessory gland infections . *Andro*. 44 (Supp1 1): 438-446.
- [17] Lewis, R. Harrison, R. Domingue, G. (1981). Culture of seminal fluid infertility clinic. *Fert. Steri.* 35,194-198.
- [18] Paavonen, J . (1998). Pelvic inflammatory disease- from diagnosis to prevention . *Derma. Clin.* 16:747-56.
- [19] Prabha, R. Sandhu, S. and Kaur, K. (2010). Mechanism of sperm immobilization by *Escherichia coli* . *Advan. Urol. Arti. ID* 240268,pp.6.
- [20] Quesada, E. Dukes, C. Deen, G. and Franklin, R.(1968). Genital infection and sperm agglutinating in infertile men. *J. Urolo.* 99,106-108.
- [21] Ramesh Babu, S. Sadhnani, M. Swarna, M. Padmavathi, P. and Reddy, P. (2004). Evaluation of bacterial levels in different subgroups of infertile males .*India . J. Clin. Biochem.* , 19(1): 45-49.
- [22] Samara, Z. Rosenberg ,S. and Madar –Shapiro ,L.(2011).Direct simultaneous detection of sexually transmitted pathogenes from clinical specimens by autocalillary electrophoresis .*Diagn Microbiol INFECT Dis*;70:17-21.
- [23] Shalika , S. Dugan, K. Smith, R. and Padilla, S. (1996). The effect of positive semen bacterial cultures on in fertilization success . *Hum Reprod.* 11: 2789-2792.
- [24] Takeuchi, F. (2005).Whole *Staphylococcus haemolyticus* evolution of human colonizing *Staphylococcus* species *J. Bacteriol* 187: 7292- 7308.
- [25] Veznik, Z. Pospisil, L. Svecova, D. Zajicova, A. and Unzeitig , V. (2004). The bacterial in the ejaculate :their influence on the quality and morphology of sperm . *Acta Obstet Gynecol Scand* , 83(7):656-60.
- [26] Weng , C. Chiu, F. and Lin, L. (2014).Bacterial communities in semen from men of infertile couples: metagenomics sequencing reveals relationships of seminal microbiota to semen quality . *PLoS ONE* , 9.(10) Article ID e110152.
- [27] Wold Health Organization (WHO) .(2010). Laboratory Manual for the Examination of Human Semen , World Health Organization , Geneva , Switzerland , 5th edition .