

## CASE REPORT

# Urinary Tract Infection In Young Healthy Women Following Heterosexual Anal Intercourse: Case Reports

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### Abstract

Urinary tract infections (UTIs) are among the most common bacterial infections in outpatient clinical settings globally. Young healthy women are at highest risk of community-acquired UTI. While uncomplicated UTI is not life-threatening, it is associated with high morbidity and treatment costs. The pathogenesis of urinary tract infection in young healthy women is complex. It is influenced by a number of host biological and behavioural factors and virulence of the uropathogen. The infecting uropathogens in community-acquired UTI originate from the fecal flora, *E. coli* being the most predominant, accounting for 80-90% of these UTIs. Vaginal colonization with uropathogens, a pre-requisite for bladder infection may be facilitated by sexual intercourse, which has been shown to be a strong risk factor and predictor of UTI. While majority of studies have explored the association between heterosexual vaginal intercourse and UTI in healthy young women, the possible association with heterosexual receptive anal intercourse has not received adequate attention despite evidence of high prevalence globally. This paper presents two young healthy married women who had severe UTI following heterosexual anal intercourse and discusses possible association thereof. Understanding the risk factors for UTI and identification of possible predisposing conditions in a particular individual are important in guiding therapeutic approaches and preventive strategies. Cognisant of reportedly high prevalence of various sexual practices including receptive heterosexual anal intercourse and their impact on individuals' health, details on sexual history should always be enquired into in young women presenting with genito-urinary complaints. (*Afr J Reprod Health 2015; 19[2]: 134-139*).

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**Keywords:** Uncomplicated UTI, young healthy women, heterosexual anal intercourse

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### Résumé

Les infections des voies urinaires (IVU) sont parmi les infections bactériennes les plus courantes dans les milieux cliniques ambulatoires à l'échelle mondiale. Les jeunes femmes en bonne santé sont plus à risque de l'IVU acquis au sein de la communauté. Alors que les IVU non-complicquée ne posent pas de danger à la vie, elles sont associées à des coûts élevés de morbidité et de traitement. La pathogenèse de l'infection des voies urinaires chez les jeunes femmes en bonne santé est complexe. Elle est influencée par un certain nombre de facteurs d'hôte biologique et comportementaux et la virulence de l'uropathogène. L'uropathogène responsable des infections dans les IVU acquises dans la communauté proviennent de la flore fécale, *E. coli* qui est le plus prédominant, qui représente 80-90% de ces infections urinaires. La colonisation vaginale avec uropathogène, un pré-requis pour une infection de la vessie peut être facilitée par les rapports sexuels, ce qui a été démontré pour comme étant un facteur de risque important et un indice de l'IVU. Alors que la majorité des études ont exploré l'association entre les rapports sexuels vaginaux hétérosexuels et infections urinaires chez les jeunes femmes en bonne santé, on n'a pas accordé assez d'attention à l'association possible avec les rapports hétérosexuels anaux réceptif, malgré les preuves d'une forte prévalence à l'échelle mondiale. Cet article présente deux jeunes femmes mariées en bonne sante qui souffraient des IVU graves suite des rapports hétérosexuels anaux et discute l'association possible de cela. Comprendre les facteurs de risque d'infection urinaire et l'identification des conditions prédisposants possibles chez un individu particulier sont importants dans l'orientation des approches thérapeutiques et les stratégies de prévention. Vue la haute prévalence de diverses pratiques sexuelles, y compris les rapports hétérosexuels anaux réceptifs leurs impacts sur la santé des individus, il faut toujours obtenir des détails sur l'histoire sexuelle des jeunes femmes qui présentent des plaintes génito-urinaires. (*Afr J Reprod Health 2015; 19[2]: 134-139*).

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**Mots-clés:** IVU sans complication, jeunes femmes en bonne santé, rapports hétérosexuels anaux

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### Introduction

Urinary tract infections (UTIs) are a major public health concern globally, affecting people of both

sexes and all age groups. They are one of the most common bacterial infections seen in clinical settings especially primary health care<sup>1,2</sup>. They

may be community- or hospital-acquired, the former usually in otherwise healthy individuals. Women are particularly more prone to community-acquired UTIs than men, basically because of anatomical differences, namely the close proximity of the vaginal introitus and urethral meatus to the anal opening and the length of the female urethra<sup>3</sup>. The anatomical relationship of the female urethral meatus to the vagina tends to expose it to increased chances of trauma during sexual intercourse<sup>4</sup>.

Uncomplicated UTI is common in adult women across the entire age spectrum, but the mean incidence peaks in the 15 to 39 year age bracket<sup>5</sup>. This is also the period of maximum sexual and reproductive activity in many women's lives. About 40-50% of women will have at least one episode of UTI in their lifetime<sup>1,6</sup>. Of these 20-30% will have a second episode, of whom, 25% will suffer recurrent UTI (RUTI)<sup>7</sup>, defined as at least three episodes of UTI in the preceding twelve months<sup>8</sup>.

The pathogenesis of uncomplicated UTI in young healthy women is reportedly complex and is influenced by many host biological and behavioural factors and virulence properties of the infecting uropathogens<sup>4</sup>. It is widely accepted that the bacteria responsible for majority of UTIs in these individuals originates from the lower gut, i.e. the rectum<sup>1</sup>. These are part of normal fecal/rectal flora, which includes *Escherichia coli* (*E. coli*), *Klebsiella* species, *Proteus* species and *Enterococci*, with *E. coli* being the most predominant. It is also the most common pathogen, accounting for 80-90% of community-acquired and 30-50% of nosocomially-acquired UTI<sup>9,10</sup>. Vaginal colonization by uropathogens is a pre-requisite for bladder infection (cystitis). Factors that increase the risk of UTI in young healthy women generally do so by facilitating vaginal colonization by uropathogens. Sexual intercourse has been shown to be one of the most important risk factors for uncomplicated or community-acquired UTI in young healthy women<sup>11-15</sup>. It is a very strong predictor of UTI in them, with frequency and recency thereof increasing the risk<sup>4,7,11,12,15</sup>. Sexual intercourse increases the chances of bacterial contamination of the female urethra and may introduce bacteria into

the bladder through the urethra<sup>16</sup>. Every time a woman has sexual intercourse she comes into contact with bacteria and puts herself at risk for UTI. Emiru and colleagues (2013) in their study in Ethiopia among healthy pregnant women with UTI found that sexual intercourse more than three times per week significantly increased the risk of UTI<sup>17</sup>.

Most of the studies which have explored the role of sexual intercourse in the causation of UTI in young healthy women have focused on heterosexual penile-vaginal intercourse. The possibility of receptive heterosexual anal intercourse has only been mentioned in a couple of studies<sup>18,19</sup>. This is in spite of reportedly high prevalence of this sexual practice in literally all societies globally<sup>20-23</sup>.

Considering the pathogenesis of community-acquired UTI in young healthy women, the fact that those who engage in anal intercourse are also likely to have penile-vaginal intercourse simultaneously, it is very possible heterosexual receptive anal intercourse is a significant risk factor for UTI among young healthy sexually active women.

This paper presents two young African women with severe UTI following receptive anal intercourse with their husbands. The importance of detailed sexual history in young women presenting with symptoms of UTI is highlighted.

### Case Reports

**CASE 1:** Ms VAM, a 26 year old lawyer, para 1+0, married to a 30 year old engineer, presented with a three day history of dysuria, frequency and urgency. She also had suprapubic pain and deep dyspareunia. There was no history of abnormal vaginal discharge. She had no previous history of any medical illnesses such as diabetes mellitus; previous pelvic surgical procedures or urinary catheterization. Her husband who worked away from home had been home for the past two weeks. Upon physical examination the notable findings were suprapubic tenderness and tender anterior fornix. A diagnosis of acute UTI was made. A urine test showed leucocyte count of >999/uL and profuse growth of *E. coli* on culture (non-ESBL), which was sensitive to amoxicillin-clavulanic acid

among other antibiotics. As she had been started on it while awaiting culture results this was continued for a total of seven days.

She was reviewed two weeks later. She was well and urine test revealed normal results. As she was being counselled on possible causes/risk factors and preventive strategies, she indicated that over the preceding two weeks they had sexual intercourse daily and some days up to four times. She also said that they had frequent anal intercourse in the week prior to the symptoms. Very often they would start with anal intercourse and because she would not climax that way, they would switch to vaginal intercourse for her to do so. She was advised to either stop it, or if they wanted to continue doing it either have anal intercourse only, use condom and change/remove it before vaginal intercourse, or start with vaginal and finish with anal intercourse.

She was reviewed three months later, and she had no health concerns. She eventually conceived and I had the privilege of looking after her pregnancy, overseeing her delivery and postnatal period. She did not have repeat episode of UTI throughout these periods.

**CASE 2:** Ms MWK, a 32 year old high school teacher, a mother of two, married to a university graduate businessman, presented with a two day history of pain on passing urine, frequency and urgency. She had no other complaints and no previous history of medical illnesses or surgical procedures. She and her husband had been on a week's holiday to celebrate their wedding anniversary and had just returned to the city the previous day. She had not suffered from UTI before. On sexual history, she indicated that they were fairly liberal and adventurous on sexual matters. They had oral sex and anal intercourse on a regular basis. This particular holiday they had anal intercourse almost daily without protection. She was using intrauterine copper T for contraception.

The only significant finding on examination was suprapubic tenderness.

Urine tests revealed markedly elevated leucocytes >999/uL, bacteria ++, and proteinuria ++, and urine culture grew *Proteus mirabilis* sensitive to among other antibiotics—

Ciprofloxacin. She had been started on nitrofurantoin while waiting for culture results. This was switched to ciprofloxacin for seven days.

She was reviewed seven days after completing the treatment course, and she had no complaints. A urine analysis showed normal results. She was counselled on possible predisposing factors to the UTI, including anal intercourse which they engaged in, and advised on preventive strategies. During a scheduled review three months later she had no complaints. I saw her during her annual check and routine screening for cancer of cervix uteri. She was well.

## Discussion

Although several different micro-organisms can cause urinary tract infections in young healthy women, including viruses, fungi and bacteria, most UTIs in this population is caused by bacteria<sup>24</sup>. Majority of these bacteria are part of the fecal flora, which include *E. coli* and *Proteus mirabilis*, the two organisms responsible for UTI in the presented cases. *E. coli* is the most common bacterial cause of UTI in young healthy women globally. The proportion varies from one geographical location to another, and so too does that due to *Proteus mirabilis*. I see on average one to two young otherwise healthy women with acute UTI in my private practice monthly. Majority are due to *E. coli*. This is the only case due to *Proteus mirabilis*, I have seen. I've also just seen one other due to *Staphylococcus aureus* and one due to *Pseudomonas aeruginosa* in the past five years. I routinely do urine culture to confirm the diagnosis, identify the causative micro-organism as well antibiotic susceptibility.

The risk factors for uncomplicated UTI in young healthy women such as the two presented cases, are sexual intercourse, use of vaginal spermicides either condom- or diaphragm-coated and previous history of UTI<sup>1,4,12,13,16,17</sup>. Sexual intercourse and history of UTI are the most important predictors of UTI among this group of women<sup>12</sup>. Fihn and colleagues (1996) showed that spermicide-coated condoms were responsible for 42.0% of UTIs among those exposed to them and that the prevalence increased with frequency of use<sup>25</sup>. The two presented cases had no previous

history of UTI and had not used condoms or spermicides. They were however sexually active and both had had intense and frequent sexual intercourse in the preceding seven days or so. These together with the recentness of the sexual intercourse could have contributed to their symptoms.

The bacteria responsible for the UTI in these two cases, i.e. *E. coli* and *P. mirabilis* are part of normal rectal flora. Both have been shown to be responsible for community-acquired UTI, with *E. coli* accounting for 80-90% and *P. mirabilis* accounting for 1-2% of UTIs<sup>1,9-11</sup>. *P. mirabilis* is more commonly seen in cases of complicated UTI i.e. in those with functional or anatomical urinary tract abnormalities or following prolonged instrumentation such as catheterisation<sup>26</sup>. In cases of community-acquired UTI due to *P. mirabilis* young sexually active women having unprotected sexual intercourse are at slightly higher risk<sup>27</sup>. The presented patient with *P. mirabilis* was young, sexually active and had unprotected sexual intercourse. It has been suggested that uropathogenic *E. coli* (UPEC) can be transmitted between persons during sexual intercourse as women who had UTI were found to be more significantly colonized in their vaginas with the same *E. coli* as that found in their rectum, 66.0% vs 18.0% for those without UTI. It has also been shown that the frequency of this association, i.e. having similar *E. coli* in the vagina and rectum decreases with passage of time since last intercourse by 25% with each day<sup>29</sup>.

Colonisation of the vaginal introitus with uropathogens is essential in the pathogenesis of UTI in young healthy women<sup>13</sup>. The presented women had frequent receptive anal intercourse in the days preceding the UTI. The role of unprotected heterosexual receptive anal intercourse in the pathogenesis of UTI in young healthy women has not been appropriately studied and/or reported on. Only a handful of publications have reported on it. Tchoudomirova and colleagues (1998) observed that young women with recurrent UTI at FP and youth clinics were those who more often had practiced oral sex, experienced anal intercourse as well as masturbated<sup>18</sup>. Coull et al (2008) reported on nine patients with UTI following unprotected

heterosexual anal intercourse, one of whom was a 27 year old woman<sup>19</sup>. The two presented cases had regular and recent receptive anal intercourse with their husbands. It is very possible that this was a predisposing factor for the UTI in them. The penis would be an efficient transporter of uropathogenic *E. coli* and *P. mirabilis* from the anus/rectum during anal intercourse into the vagina as both of the admitted to having vaginal intercourse following anal intercourse without washing the penis. The importance of heterosexual receptive anal intercourse in sexual health is increasingly becoming well-defined by epidemiological and clinical studies<sup>30</sup>. Receptive anal intercourse has also been shown to be associated with genital candidiasis (VVC)<sup>31</sup>. The main source of *Candida* in genital candidiasis is the rectum, just like the uropathogens involved in these two cases.

Cognisant of the foregoing and the documented high prevalence of heterosexual receptive anal intercourse even among normal relationships in literally all societies globally reported to be as high as 36%,<sup>20-23,32-37</sup> it may not be too far-fetched to consider it as an important risk factor for UTI in young sexually active women. The paucity of published reports on this may be partly attributed to the fact that anal intercourse has been associated with homosexuality and is a taboo subject in many societies. Many health care workers and their patients would be uncomfortable discussing it.

## Conclusions and Recommendations

Community-acquired UTI is quite common in young healthy sexually active women and sexual intercourse is an important predictor thereof. Women with UTI have been shown to have similar *E. coli* in their vagina as well as their rectum and the source of the uropathogens in healthy women is the rectum. Receptive heterosexual anal intercourse has not only been reported to be a common practice globally but also on the increase<sup>34</sup>, common in both low- and high-income settings and on a regular basis<sup>35</sup>, in new as well as established partnerships globally<sup>36</sup> and now considered a part of an expanding sexual repertoire<sup>38</sup>. This sexual practice may be an important risk factor for community-acquired UTI

in such individuals.

It is therefore important that health care workers whether in public or private settings include detailed sexual history including anal intercourse during history taking for women with genitourinary symptoms such as UTI or genital candidiasis. There is also need for well-structured clinical and epidemiological studies to determine possible association between heterosexual receptive anal intercourse and UTI in young healthy individuals. Such information is invaluable in designing preventive strategies thereof.

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