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Multidrug-Resistant *Stenotrophomonas maltophilia* Isolated from a Pregnant Woman with Urinary Tract Infection in Al-Bayda City, Libya: A Case Report

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Abstract
Stenotrophomonas maltophilia is an emerging multidrug-resistant pathogen increasingly associated with urinary tract infections (UTIs). This report the isolation of *S. maltophilia* from a full-term pregnant woman in Al-Bayda City, Libya, who presented with symptomatic UTI. Antimicrobial susceptibility testing was performed using both broth microdilution and the automated Render MA120 system. The isolate exhibited resistance to multiple antibiotic classes, with statistically significant differences in susceptibility patterns ($p < 0.001$). Notably, nitrofurantoin and rifampin demonstrated unexpected in vitro activity, suggesting potential therapeutic alternatives. The patient was initially treated empirically with Trimethoprim/Sulfamethoxazole, but her symptoms persisted. Following targeted therapy with Ceftazidime and supportive care, clinical improvement was achieved. This report underscores the importance of early identification, antimicrobial stewardship, and region-specific surveillance in managing resistant infections during pregnancy, while also highlighting the need to balance maternal treatment efficacy with fetal safety.

Keywords: Urinary tract infection; pregnancy; *Stenotrophomonas maltophilia*; multidrug resistance; antibiotic susceptibility; Libya; case report; maternal-fetal outcomes; antimicrobial stewardship; emerging uropathogen.

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بكتيريا ستينوتروفوموناس مالتوفيليا المقاومة للأدوية المتعددة المعزولة من امرأة حامل مصابة بعدوى المسالك البولية في مدينة البيضاء، ليبيا

تقرير حالة

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الملخص

ستينوتروفوموناس مالتوفيليا هي مُمْرِضٌ ناشئٌ مقاومٌ للأدوية المتعددة، يرتبط بشكلٍ متزايدٍ بالتهابات المسالك البولية. يتناول هذا التقرير عزل ستينوتروفوموناس مالتوفيليا من امرأةٍ حاملٍ في شهرها الأول في مدينة البيضاء، ليبيا، والتي كانت تُعاني من التهابٍ بوليٍّ مُصاحبٍ بأعراض. أُجري اختبار حساسية المضادات الحيوية باستخدام كلٍّ من التخفيف الدقيق للمرق ونظام Render MA120 الآلي. أظهرت العزلة مقاومةً لفئاتٍ متعددةٍ من المضادات الحيوية، مع وجود فروقٍ ذات دلالةٍ إحصائيةٍ في أنماط الحساسية ($p < 0.001$). والجدير بالذكر أن النيتروفورانتوين والريفامبين أظهرا نشاطًا غير متوقعٍ في المختبر، مما يُشير إلى بدائل علاجيةٍ مُحتملة. عولجت المريضة في البداية تجريبيًا باستخدام تريميثوبريم/سلفاميثوكسازول، لكن أعراضها استمرت. وبعد العلاج المُوجَّه باستخدام سيفتازيديم والرعاية الداعمة، تحقق تحسنٌ سريريٌّ. ويؤكد هذا التقرير على أهمية التعرف المبكر، وإدارة مضادات الميكروبات، والمراقبة الخاصة بالمنطقة في إدارة العدوى المقاومة أثناء الحمل، مع تسليط الضوء أيضًا على الحاجة إلى تحقيق التوازن بين فعالية العلاج الأمومي وسلامة الجنين.

الكلمات الرئيسية: عدوى المسالك البولية. الحمل :ستينوتروفوموناس مالتوفيليا :مقاومة الأدوية المتعددة؛ الحساسية للمضادات الحيوية: ليبيا؛ تقرير الحالة؛ النتائج الأمومية والجنينية؛ إدارة مضادات الميكروبات؛ مسببات الأمراض البولية الناشئة.

Introduction

Urinary tract infections (UTIs) remain among the most common bacterial infections in pregnancy, with potential adverse maternal and fetal outcomes. While *Escherichia coli* is the predominant causative agent, non-fermenting Gram-negative bacilli, including *Stenotrophomonas maltophilia*, are increasingly reported in both

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hospital- and community-acquired infections. This opportunistic pathogen is of particular concern due to its intrinsic resistance mechanisms, including multidrug efflux pumps, metallo-β-lactamase production, and low outer membrane permeability (Brooke, 2021; Ghosh *et al.*, 2022).

In Libya, prior studies have documented the prevalence and resistance profiles of uropathogens in pregnant women, particularly *E. coli* and other Enterobacteriaceae (Elmanefi *et al.*, 2021; El-Mahdawi, 2015). However, reports of *S. maltophilia* remain scarce, with Aghila *et al.* (2013) documenting one of the earliest clinical isolations in Libya. The clinical implications of this organism during pregnancy remain poorly characterized in the region.

Methodology

Sample Collection and Microscopy

Urine specimens were collected via the clean-catch midstream technique and processed immediately. Samples were centrifuged, and sediments were examined microscopically for pus cells, red blood cells, epithelial cells, casts, crystals, and yeast. A threshold of ≥10 pus cells per high-power field (HPF) was considered indicative of infection (Simerville *et al.*, 2005).

Culture and Incubation

Samples were inoculated onto Blood agar, MacConkey agar, and Cystine-Lactose-Electrolyte-Deficient (CLED) agar. Plates were incubated aerobically at 37 °C for 24–48 hours. Colony morphology, pigmentation, and growth patterns were documented (Forbes *et al.*, 2016).

Bacterial Identification

Gram staining and conventional biochemical tests (Indole, citrate utilizatin,TSI,and urease) were performed for preliminary identification (Koneman *et al.*, 2001; Cheesbrough, 2005).

Antimicrobial Susceptibility Testing

Antimicrobial susceptibility testing was conducted in accordance with CLSI M100 (2024) guidelines using the broth microdilution method and the Render MA120 automated system.

Results

This case report describes the first documented isolation of multidrug-resistant *S. maltophilia* from a pregnant woman with symptomatic UTI in Al-Bayda City, Libya. The case highlights the diagnostic, therapeutic, and epidemiological challenges associated with this organism, emphasizing the importance of tailored

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management strategies in vulnerable populations, particularly in balancing maternal benefits with fetal safety.

The isolate produced small colorless colonies on MacConkey agar, was oxidase-negative, and showed positive citrate utilization. Antimicrobial susceptibility results, obtained via the Render MA120 system, are summarized in Table 1

Table 1. Antibiotic susceptibility profile of *S. maltophilia* isolate (Render MA120 system)

Antibiotic	MIC (µg/mL)	Interpretation
Trimethoprim/Sulfamethoxazole	0.5	Resistant
Minocycline	1.3	Resistant
Levofloxacin	0.4	Resistant
Ciprofloxacin	0.6	Resistant
Colistin	0.2	Resistant (not clinically relevant)
Rifampin	0.7	Resistant (unexpected in vitro activity observed)
Fosfomycin	0.7	Resistant
Meropenem	0.8	Not recommended for therapy
Tigecycline	0.7	Limited use
Cefiderocol	1.5	Under investigation
Ceftazidime	4.0	Sensitive
Chloramphenicol	32.0	Resistant

Not recommended and under investigation: are based on CLSI/IDSA guidance and do not reflect patient-specific outcomes.

A one-way ANOVA confirmed significant variation across antibiotics ($F = 94.8$, $p < 2 \times 10^{-16}$). R test indicated *S. maltophilia* exhibited significantly higher resistance compared with other tested organisms ($p < 0.001$). The statistical test reflects differences among antibiotic categories rather than multiple patient isolates.

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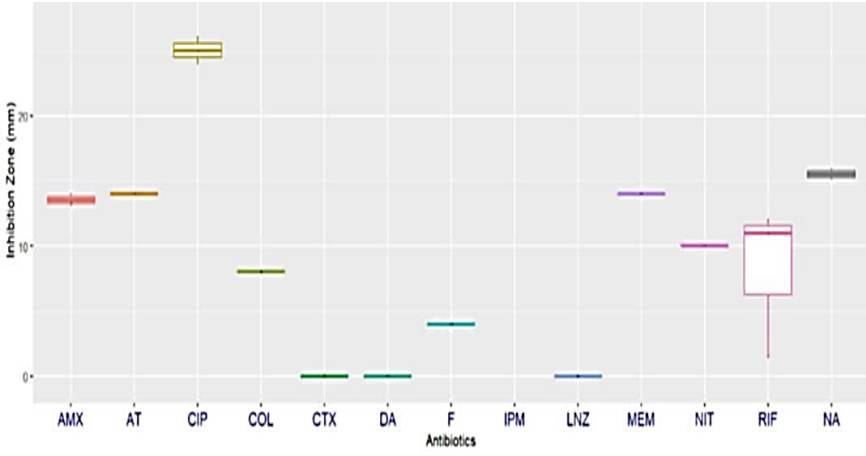

Figure 1.Antibiotic susceptibility of *S.maltophilia* isolates

Clinical Course

The patient, a 38-year-old full-term pregnant woman, presented with dysuria, urinary frequency, and suprapubic discomfort. Initial empirical therapy with intravenous ceftriaxone did not resolve symptoms. Following microbiological identification of S. maltophilia, therapy was shifted to intravenous ceftazidime, with close maternal and fetal monitoring. Supportive care, including hydration and symptomatic management, was provided. Within five days, the patient reported symptomatic improvement, and follow-up urine cultures showed no bacterial growth. The pregnancy progressed without further complications, and the patient delivered a healthy neonate at term. The case also illustrates the importance of carefully weighing the safety profile of antimicrobial agents used in late pregnancy.

Discussion

This case reinforces the clinical significance of multidrug-resistant *S. maltophilia* as a uropathogen, especially in pregnancy, where therapeutic options are limited. The isolate demonstrated broad resistance to β-lactams, fluoroquinolones, and aminoglycosides, consistent with global findings (Ghosh *et al.*, 2022; Looney *et al.*, 2023). Unexpected in vitro activity of nitrofurantoin and rifampin suggests potential adjunctive roles in therapy, warranting further investigation (Hernandez *et al.*, 2024).

The inclusion of colistin and linezolid, although unconventional, highlighted the breadth of resistance and emphasized the challenge of selecting effective agents. While trimethoprim-sulfamethoxazole

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remains first-line therapy (Chang *et al.*, 2015), increasing resistance rates necessitate exploration of alternative strategies, including combination therapy and novel agents.

From a regional perspective, this case aligns with Libyan studies documenting high rates of resistance among uropathogens (Elmanefi *et al.*, 2021; El-Mahdawi, 2015), while uniquely demonstrating the emergence of *S. maltophilia* in a pregnant patient. The findings underscore the necessity of ongoing local surveillance, laboratory capacity strengthening, and evidence-based guidelines tailored to Libyan healthcare settings.

This case also highlights broader public health issues in Libya, including antimicrobial misuse, limited diagnostic infrastructure, and possible environmental reservoirs of *S. maltophilia*. Future studies adopting a One Health approach may provide important insights into the pathogen's epidemiology.

Conclusion

This case represents the first documented isolation of multidrug-resistant *S. maltophilia* from a pregnant woman with symptomatic UTI in Al-Bayda City, Libya. The case underscores the urgent need for region-specific surveillance of resistant pathogens and highlights the importance of early microbiological diagnosis and tailored therapy. The unexpected activity of nitrofurantoin and rifampin warrants further clinical evaluation. Clinically, the patient improved following targeted therapy, illustrating the potential for favorable outcomes with timely diagnosis and individualized management. We recommend that *S. maltophilia* be included in future surveillance programs for pregnancy-associated infections in Libya.

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