



# Acute pulmonary edema as a complication of urinary infection in pregnant women: a case report

Lorena Silvestre Gabioli<sup>1</sup>, Katia Lara de Souza<sup>1</sup>, Tamara Veiga Faria<sup>1\*</sup>

<sup>1</sup> FACERES – Medical School of São José do Rio Preto, São Paulo, Brazil.

\*Corresponding author: Dr. Tamara Veiga Faria,  
FACERES – Medical School of São José do Rio Preto,  
São Paulo, Brazil.

E-mail: tamaraveiga@yahoo.com.br

DOI: <https://doi.org/10.54448/mdnt21625>

Received: 09-11-2021; Revised: 11-14-2021; Accepted: 12-08-2021; Published: 12-17-2021; MedNEXT-id: e21625

## Abstract

**Introduction:** Urinary infection (UI) is the third most common pathology during pregnancy, affecting 10-12% of pregnant women in the first trimester. Thus, the prenatal care is important to reduce indicators of maternal-fetal mortality, promoting quality of life during pregnancy and postpartum. **Objective:** The aim of this study is to report the case of a pregnant woman with pyelonephritis, who evolved with acute pulmonary edema. **Case report:** The present study was elaborated according to the rules of **CARE case report**. This study was analyzed and approved by the Research Ethics Committee (CEP) according to a substantiated opinion number 4,375,418 and obtaining the patient's consent. The present study therefore highlights pyelonephritis as the most severe form of UI in pregnant women, associated with septic shock, with evolution to respiratory failure, resulting from acute pulmonary edema, and may be related to worse maternal-fetal prognoses. This clinical study contributes to the literature, emphasizing that, currently, all forms of UI during pregnancy should be considered as great potential for complications, and should be treated even in its asymptomatic form. **Conclusion:** It is evident the need for early intervention to minimize maternal-fetal losses, unnecessary interventions and to reduce costs in relation to additional treatments. The importance of rapid diagnosis and early treatment is emphasized in order to minimize or extinguish the damage. As well as promoting actions to encourage pregnant women to perform prenatal care.

**Keywords:** Pregnancy. Pyelonephritis. Acute pulmonary edema. Complications. Sepsis.

## Introduction

Urinary infection (UI) is the third most common

pathology during pregnancy, affecting 10-12% of pregnant women in the first trimester [1,2]. This disorder in the gestational period can cause perinatal damage, such as reduced intrauterine growth, early rupture of the amniotic membrane, preterm birth, low weight, changes in the central nervous system, anemia, sepsis, transient renal dysfunction and perinatal death [2,3].

Maternal and child care has been a subject that has been addressed in the area of public health, evidencing the importance of prenatal care to reduce indicators of maternal-fetal mortality, promoting quality of life during pregnancy and postpartum [4,5-7].

The aim of this study is to report the case of a pregnant woman with pyelonephritis, who evolved with acute pulmonary edema.

## Case report

The present study was elaborated according to the rules of CARE case report [8]. Available in: <https://www.care-statement.org/>.

## Ethical Aspects

This study was analyzed and approved by the Research Ethics Committee (CEP) according to a substantiated opinion number 4,375,418 and obtaining the patient's consent through the Informed Consent Form (TCLE) according to CNS/CONEP Resolution 466/12.

## Patient Information and Clinical Findings, Timeline, Diagnostic Assessment, Therapeutic Intervention and Follow-up

The patient K.L.S., 25 years old, female, G4P3A0, pregnant, born and resident in Cássia - MG. In his

prenatal consultation (8 weeks of gestation), the urine routine showed positive nitrite, numerous pyocytes, 1 red blood cell per field, 8 epithelial cells per field and highly modified flora. Urine with cloudy and yellowish appearance. Uroculture with antibiogram presented *Escherichia Coli*, not resistant to any antimicrobial tested. Even asymptomatic, your gynecologist prescribed antibiotic therapy (Cephalexin 500mg, VO, 6/6 hours, 7 days). The patient followed the home treatment correctly, but four months later (24 weeks of gestation), she sought the Emergency Room in her city with fever and dysuria and no tests were performed. She remained hospitalized for two days with intravenous antibiotic (Ceftriaxone 1g, 12/12 hours) and was discharged with ceftriaxone prescription (1g, IM, 24/24 hours, 7 days) to treat UI. However, the patient reports that she did not follow with home treatment, because she was afraid to take intramuscular medication and would return to the gynecologist for better instructions. However, his symptoms evolved in a few hours and soon returned to the Emergency Room with fever of 39°C, blood pressure (BP) of 130×80 mmHg, bilateral lumbar algia, dyspnea and shorthand. The results of his serum tests showed high creatinine (1.5mg/dL), high C-reactive protein (108 mg/dL), total bilirubin (1.78mg/dL), hemoglobin and low hematocrits (8.60 g/dL and 24.80%, respectively), thrombocytopenia (87000/mm<sup>3</sup>). TGO 25 U/l, TGP 29 U/l and urea 29 mg/dL, dosages within the values of laboratory references. Uroculture was also performed with antibiogram which revealed isolated culture of *Enterococcus* sp, sensitive to Penicillin, Nitrofurantoin, Ampicillin, Amoxicillin with Clavulanic Acid, Norfloxacin, Ciprofloxacin, Levofloxacin and Phosphomycin. Tetracycline resistant only. On physical examination: Giordano positive. With the diagnosis of pyelonephritis, she was hospitalized again, using ceftriaxone (1g, 2EV, 12/12 hours), prophylaxis for Deep Intravenous Thrombosis (DIT) with Clexane 40mg, 1SC, single dose and oxygen therapy. However, on the fourth day of hospitalization, the patient had 100 mmHg ≤ and taquipneica (40 pm), according to the clinical criteria of qSOFA ≥ 2 points, admitting an organic dysfunction with urinary focus. In addition, with the hemoglobin rate equal to 7.40g/dL, hematocrit equal to 20.80% and platelet count equal to 102,000/mm<sup>3</sup>, the patient underwent blood transfusion. Therefore, treatment with Ceftriaxone (1g, 2EV, 12/12 hours) persisted, associated with Garamycin (80mg, 2EV, 12/12 hours) and Clexane (40mg, 1SC, however, dyspnea progressed and chest X-ray was performed, which demonstrated acute pulmonary edema. In this context, in addition to the previous medications, a diuretic, Lasix (10mg/1EV/single dose) was added to the therapeutic

regimen. The patient remained hospitalized for another seven days and was discharged with significant improvement. Despite the clinical picture in the midst of pregnancy, cesaria delivery was performed at 39 weeks, without complications.

## Discussion

The present study therefore highlights pyelonephritis as the most severe form of UI in pregnant women, associated with septic shock, with evolution to respiratory failure, resulting from acute pulmonary edema, and may be related to worse maternal-fetal prognoses. This clinical study contributes to the literature, emphasizing that, currently, all forms of UI during pregnancy should be considered as great potential for complications, and should be treated even in its asymptomatic form [2,4].

As in the gestational period the therapeutic set is limited due to the toxicity of certain drugs to the embryo, early diagnosis and appropriate treatment adhering are necessary for a better maternal-fetal prognosis [2]. Thus, avoiding complications that generate damage during pregnancy, childbirth and postpartum is the main objective of treatment [9]. Thus, professionals should be of additional concern to patients with low levels of socioeconomic and with high parity, because generally, they do not adherence to treatment due to the high cost of therapy or do not understand the need for therapy, as well as may not recognize the importance of prenatal follow-up.

During pregnancy, mechanical, biochemical and immunological changes may trigger or exacerbate respiratory pathologies. For the development of pulmonary edema, there are intrinsic and extrinsic factors, subdividing it into cardiogenic and non-cardiogenic. There are heart diseases and rheumatic diseases that are not tolerable in pregnancy and culminate in acute cardiogenic edema. However, in this study, noncardiogenic acute edema prevails, a common cause of maternal mortality. Septic shock, aspiration pneumonia, obstetric hemorrhage, trophoblast pathology, amniotic fluid embolism, pyelonephritis and fetal death syndrome increase pulmonary permeability, culminating in edema [10].

In this context, the present case may be associated with acute non-cardiogenic pulmonary edema as a consequence of urinary tract infection (UTI). UI is secondary to tissue damage caused by bacterial endotoxins, especially in cases that progress to pyelonephritis [2,4]. The resulting endothelial capillary lesion, together with decreased vascular resistance, the decline in respiratory functional residual capacity and osotic pressure, and changes in cardiac output can lead

to serious complications such as septic shock, disseminated intravascular coagulation (DIC), Respiratory Failure (ARDS) [3].

The main focus of infection is the urinary tract due to physiological and anatomical changes, mainly caused by the gram-negative bacterium *E. Coli*. Complicated UI may culminate in non-obstetric sepsis, which should be identified early. In the case reported, as the patient was not in the UTI, quick SOFA (qSOFA) was used as a screening tool denoting the risk of complications and death. It is noteworthy that the qSOFA score does not define or diagnose sepsis, but warned the medical team for rapid intervention. This score evaluates three clinical signs as respiratory rate > 22 pm, altered level of consciousness and systolic blood pressure < 100 mmHg. The presence of two or more criteria is associated with an unfavorable outcome or long stay in the UTI [11].

ARDS is associated with high mortality rates: in the general population it is 35-60%, while in pregnancy it is 23-39% [3]. The incidence of ARDS by pyelonephritis occurs at about 7%. The predominant symptoms are dyspnea, aquipnea, and hypoxemia. Chest x-ray shows acute pulmonary edema. Thus, monitoring of pregnant women with acute pyelonephritis, especially within the first 72 hours after admission, is crucial. Recognition of the septic condition, as well as treatment with resuscitation and antibiotic therapy, should be early for better maternal-fetal prognosis. An infectious condition can induce uterine contractions, cervical changes, and lead to premature labor. Delivery should be performed when the mother is hemodynamically stable, reducing the risk of maternal-fetal mortality [12]. Therefore, rigorous conduct ensures that pregnancy is maintained until the desirable time and reduces additional expenses to solve these events that could be avoided [6].

Given the serious complications discussed, it is undoubted: the diagnosis and treatment of urinary tract infections in pregnancy cannot be disregarded. It is essential to track in prenatal care asymptomatic bacteriuria to avoid complications and perform appropriate antibiograms for pregnant women, aiming at choosing the best antibiotic. Always value the clinical signs of symptomatic forms to treat early and prevent the evolution to sepsis and other serious complications. However, it is necessary that professionals respond to risk factors, recurrence criteria and the need for antibiotic or adjuvant prophylaxis. Finally, always guide pregnant women and puerperary women on water habits, diuresis, intimate hygiene and the use of correct medications [13].

## Conclusion

It is evident the need for early intervention to minimize maternal-fetal losses, unnecessary interventions and to reduce costs in relation to additional treatments. The importance of rapid diagnosis and early treatment is emphasized in order to minimize or extinguish the damage. As well as promoting actions to encourage pregnant women to perform prenatal care.

## Acknowledgement

Nil.

## Ethics approval

This study was analyzed and approved by the Research Ethics Committee (CEP) according to a substantiated opinion number 4,375,418 and obtaining the patient's consent through the Informed Consent Form (TCLE) according to CNS/CONEP Resolution 466/12.

## Informed consent

The patient signed the consent form.

## Funding

Not applicable.

## Data sharing statement

No additional data are available.

## Conflict of interest

The authors declare no conflict of interest.

## About the License

© The authors (s) 2021. The text of this article is open access and licensed under a Creative Commons Attribution 4.0 International License.

## References

1. Zanoteli S, Zatti CA, Ferraboli SF. Clinical complications of pregnancy. *Braz. J. Surg. Clin. Res*, v. 4, n. 2, p. 05-10, 2013.
2. Duarte Geraldo, Marcolin Alessandra Cristina, Quintana Silvana Maria, Cavalli Ricardo Carvalho. Urinary tract infection in pregnancy. *Rev. Bras. Ginecol. Obstet.* 2008; 30(2): 93-100.
3. Castro DM, J Gonçalves, Braga JS. Acute pyelonephritis in pregnancy complicated by acute respiratory distress syndrome – regarding two clinical cases. *Acta Obstet Ginecol Port.* 2015;9(2):174-8.
4. Mata KS, Santos AAP, Silva JMO, Holanda JBL,

- Silva FCL. Complications caused by urinary tract infection during pregnancy. *Rev. Space for health* [Internet]. Oct-Dec, 2014. 15 (4): 57-63.
5. Matos KLA, Morais L de O, Cavalcante CC, Nunes EJJ, Pereira TZ, Silva LP, Potros FR, Antunes Rabelo KLM, Maia PR, Ribeiro FM. Sepsis during the gestational period. *REAS*, 2019; 11(17): e1166.
  6. Santos Filho OO, Telini AH. Urinary tract infections during pregnancy. São Paulo: Brazilian Federation of Gynecology and Obstetrics Associations (FEBRASGO); 2018.
  7. De Oliveira EC, Barbosa SM, Melo SEP. The importance of prenatal care performed by nurses. *FacMais Scientific Journal*, 2016; V.7, no. 3.
  8. Riley DS, Barber MS, Kienle GS, AronsonJK, von Schoen-Angerer T, Tugwell P, Kiene H, Helfand M, Altman DG, Sox H, Werthmann PG, Moher D, Rison RA, Shamseer L, Koch CA, Sun GH, Hanaway P, Sudak NL, Kaszkin-Bettag M, Carpenter JE, Gagnier JJ. CARE guidelines for case reports: explanation and elaboration document. *J Clin Epidemiol*. 2017 May 18. pii: S0895-4356(17)30037-9. doi: 10.1016/j.jclinepi.2017.04.026.
  9. Laks Renato, Pedroso José L., Pinto Juliana E. Marques, Gois Aécio F. T.. Sepsis during pregnancy: case report. *Rev. bras. have. intensive*, 2007.
  10. Heilberg Ita Pfeferman, Schor Nestor. Diagnostic and therapeutic approach in urinary tract infection: UTI. *Rev. Assoc. Med. Bras.* [Internet]. 2003 Jan [cited 2020 July 07]; 49( 1 ): 109-116
  11. Ministry of Health. High-risk pregnant woman: state hospital reference systems for high-risk pregnant women, 2001. Accessed: [http://bvsms.saude.gov.br/bvs/publicacoes/gest\\_antes.pdf](http://bvsms.saude.gov.br/bvs/publicacoes/gest_antes.pdf)
  12. Junior EL, Saidah TK, Evangelista PG, Amaral WN. Urinary tract infection in pregnant women a literature review. *Rev. Scientific CEREM-GO*, 2020; 1 (2): 42-45.
  13. Kantovisck MN, Giustina APD. The importance of prenatal care. Accessed: <http://www.uniedu.sed.sc.gov.br/wp-content/uploads/2016/10/MARINES-NEVES-KANTOVISCK..pdf>.