A CASE OF EMPHYSEMATOUS PYELONEPHRITIS

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INTRODUCTION

- *Emphysematous* pyelonephritis is a particularly severe form of the disease that is associated with the production of gas in renal and perinephric tissues
- Occurs almost exclusively in diabetic patients.
- It is rapidly progressive, requiring appropriate therapy to salvage the infected kidney.
- EPN presents a medical challenge in terms of diagnosis, pathogenesis, classification, and management.
- The prognosis also varies according to the authors and situations, with a mortality of less than 20% to more than 80%
- It is caused by gas-forming organisms, most commonly Escherichia coli (E. coli), in addition to Klebsiella, Clostridium, Candida, Aspergillus, Cryptococcus, and Amoeba.

CASE REPORT

• 48 year old female who is a known diabetic since 4 years on irregular treatment came to casualty in a delirious state with complaints of vomiting and upper abdominal pain since 2 days.
• On examination,
>she was febrile (102 F),
>Tachycardia was present,
>epigastric tenderness was present, bowel sounds were heard, with no orgnaomegaly or free fluid.
>Fundus examination showed Non proliferative Diabetic retinopathy.
• Random blood sugar was 480mg/dL and urine acetone was positive.
• She was subsequently admitted in ICU, ABG showed metabolic acidosis.
• Treatment for Diabetic ketoacidosis was started along with empirical antibiotic cover.
• Subsequent investigations showed
>marked leukocytosis,
>elevated urea levels,
>Ultrasound abdomen and pelvis showed dirty shadows in pelvicalycial region
>CT abdomen and pelvis (plain) was taken which confirmed diagnosis of Emphysematous pyelonephritis.
>Culture and sensitivity report was soon obtained which showed Klebsiella growth
• Patient was started on Piperacillin and tazobactam.
• Patient slowly recovered during the course of hospital stay and was discharged in a hemodynamically stable condition with insulin therapy for diabetes.

DISCUSSION

• EPN is a severe, necrotizing infection characterized by bacterial production of gas within the renal parenchyma.
• The conditions required for the generation of EPN are
(1)the presence of pathogenic bacteria capable of mixed acid fermentation[1],
(2)high levels of glucose in tissue,
(3)impaired tissue perfusion[2].
• In Diabetes the patient's compromised immune system rendered her unable to fight off infection from these gas-forming bacteria that result in EPN in this case.
• The pathogenesis of gas formation requires pathogenic bacteria capable of mixed acid fermentation, a hyperglycemic environment, and localized tissue ischemia.
• Because a hyperglycemic environment is one of the requirements in gas formation, it only makes sense that diabetes is a significant predisposing factor.
• It has been estimated that up to 95% of EPN cases have underlying uncontrolled diabetes mellitus[3].
• Furthermore, hyperglycemia in association with impaired blood supply to the kidneys from vasculopathy—both of which are prevalent in diabetic patients—facilitates the process of anaerobic metabolism[4].
• Current evidence suggests females are more susceptible to EPN because they are also more susceptible to urinary tract infections[5,6,7].
• E. coli is noted to be a very common pathogen in EPN [5-10].
• **Klebsiella however is not so common**.
• In patients with extensive/fulminant disease with hemodynamic compromise many have determined that, together with fluid resuscitation and antibiotics, immediate nephrectomy should not be delayed for the successful management of EPN [11-13].

CONCLUSION

• EPN is a severe acute necrotizing renal parenchymal infection caused by gas-forming organisms, among others.
• It posseses great risk and also posseses higher mortality than conventional cases of pyelonephritis.
• EPN should be suspected in patients who are not responding to antibiotics in which there is unexplained abnormal gas formation in the body, especially in the immuno-compromised, like the diabetic with poor glycemic control and transplant recipient on immuno-suppression.

EMPHYSEMATOUS PYELONEPHRITIS
Fig 1 : Shows air in the left kidney
Fig 2 : Shows air pockets in the bladder.
Fig 3 : Shows air in pelvi ureteric system in the left.

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