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INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/20028
DOI URL: http://dx.doi.org/10.21474/IJAR01/20028

RESEARCH ARTICLE

PINK URINE SYNDROME: A RARE COMPLICATION OF PROPOFOL INFUSION - A CASE REPORT

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Manuscript Info

Manuscript History
Received: 07 October 2024
Final Accepted: 09 November 2024
Published: December 2024

Abstract

Pink urine syndrome (PURS) is a rare and poorly documented complication that can occur during infusion of propofol, an intravenous anesthetic commonly used in general anesthesia and sedation. This phenomenon is characterized by abnormal pink or red coloration of the urine, often associated with an absence of severe clinical symptoms. Although its origin remains partially understood, it is suggested that the discoloration arises from the presence of propofol metabolites or drug degradation products. This article presents a clinical case illustrating this complication, outlining possible pathophysiological mechanisms, risk factors, as well as clinical management and implications for anesthetic practice.

Introduction:-

Propofol is a fast-acting anesthetic widely used for induction and maintenance of anesthesia, as well as for sedation in a variety of medical procedures. However, certain rare complications can occur, one of the most surprising of which is pink urine syndrome (PURS). This phenomenon, often benign and transient, remains poorly understood in the scientific literature. A number of hypotheses have been put forward to explain this unusual urine coloration in connection with propofol [1].

We report here on a clinical case illustrating this complication and attempt to explore its underlying mechanisms, risk factors and clinical considerations.

Case report

A 60-year-old man was admitted to intensive care following emergency surgery for intestinal perforation. His medical history revealed no renal history but included hypertension and type 2 diabetes. To maintain sedation during mechanical ventilation, a propofol infusion was initiated at 3 mg/kg/h.

The patient was kept under sedation for 48 hours. Approximately 36 hours after the start of the propofol infusion, a skin rash appeared with erythematopapular lesions affecting the trunk, upper and lower limbs, accompanied by a pinkish coloration of the urine in the urine bag (Image 1). No abdominal pain, fever or dysuria were reported. Biological tests, including assessment of renal function, and cyto-bacteriological examination of urine were normal. These clinical features led to the suspicion of a propofol infusion syndrome.

This case agrees with previous observations that a reduction or interruption of the infusion readily resolves SURP.

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Image 1:- Pink coloration of urine in the urine bag.

Discussion:-

Pink urine syndrome is a rare but well-documented phenomenon in the literature, although often poorly understood. Several hypotheses have been proposed to explain this unusual urine coloration in connection with propofol. Some studies suggest that propofol metabolites, such as 2,6-diisopropyl-1,4-benzoquinone, may be responsible for the pinkish coloration of urine [1]. However, further research is needed to confirm this hypothesis.

After intravenous administration, propofol is metabolized by the liver into various metabolites, some of which may be excreted in the urine. One plausible theory is that propofol degradation products, such as 2,6-diisopropyl-1,4-benzoquinone, may cause a pinkish coloration of the urine by interacting with biological pigments or compounds present in the kidneys. However, no specific studies have yet confirmed this hypothesis [4].

Another possibility is that the coloration arises from excretion of unmetabolized propofol or its intermediates, particularly in patients with particular pathophysiological features, such as impaired renal function or prolonged propofol infusion [5].

Certain characteristics may increase the risk of SURP. These include:
- **High dose or prolonged infusion of propofol**: high doses or long-term continuous infusion seem to favor the occurrence of the syndrome [6].
- **Altered renal function**: although pink urine is not necessarily a sign of renal failure, patients with a history of renal dysfunction may be at increased risk [2].
- **Other drugs**: concomitant administration of certain drugs that may interfere with propofol metabolism or renal function could increase the likelihood of SURP [7].

The differential diagnosis of pink urine syndrome includes:
- **Hematuria**: often more painful and associated with clear urinary symptoms.
- **Myoglobinuria**: often associated with severe muscle pain and signs of rhabdomyolysis.
- **Excretion of exogenous dyes**: such as dyes used in certain diagnostic tests, although in this case the patient has not received such agents [3].

Most cases of SURP are benign and reversible, as demonstrated by the clinical course of the patient described above. Management relies primarily on clinical monitoring and normalization of the propofol infusion. In more severe cases, therapeutic adjustment of the infusion or closer monitoring of renal function may be considered [8].

Conclusion:-

Pink urine syndrome is a rare complication, but one that deserves to be recognized by anesthetists and medical teams alike. Although generally benign and transient, it can be a source of concern for patients. Discontinuation of propofol, as in this case, is usually sufficient to resolve the situation without serious consequences. Nevertheless, a better understanding of the underlying pathophysiological mechanisms and risk factors could lead to improved management of this uncommon but intriguing complication [9].

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