

# INTERFERENCE OF METHOTREXATE EXCRETION IN THE ONSET OF ORAL MUCOSITIS IN PEDIATRIC ONCOLOGY PATIENTS

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## Introduction

- Acute Lymphoblastic Leukemia (ALL) is the most common childhood cancer;
- Methotrexate (MTX) is an important component of ALL treatment and Oral Mucositis (OM) is a common side effect related to MTX infusion, negatively impacting in quality of life of pediatric oncology patients;
- The excretion of MTX appears to directly interfere with the onset of OM and its severity. Measuring its excretion can benefit the multidisciplinary team in therapeutic approaches that aim to improve the management of OM in cancer patients;
- This study aims to correlate the degree of OM induced by high doses of MTX in children undergoing ALL treatment with MTX excretion.

## Methods

- A cross-sectional study was conducted with a non-probabilistic convenience sample from 2021-2022;
- Patients diagnosed with ALL, using high doses of MTX, under 19 years old, exclusively in oncological treatment at the IMIP Hospital, who signed the free and informed consent form was included;
- Data were collected using a specific form and the ChiMES scale, tabulated, and subjected to statistical analysis with SPSS, Fisher and Pearson test.

Keywords: oral mucositis; methotrexate; drug excretion

Table 1. MTX TOXITY ACCORDING TO DOSE AND INFUSION TIME. Pediatric oncology, IMIP, 2021-2022.

Dose HDMTX	Total Cycles	Anemia Hb < 11.5 N (%)	Neutropenia < 1600 N (%)	Thrombocytopenia < 140,000 N (%)	Oral mucositis grade 1 N (%)	Oral mucositis Grade 2 N (%)	Oral mucositis grade 3 N (%)
<b>2,5 g/m<sup>2</sup></b>							
- Infusion in 4 hours	5	5 (100)	4 (80)	1 (20)	0 (0)	5 (100)	0 (0)
<b>5,0 g/m<sup>2</sup></b>							
- Infusion in 4 hours	10	10 (100)	6 (60)	3 (30)	4 (40)	6 (60)	0 (0)
- Infusion in 24 hours	8	8 (100)	7 (87.5)	5 (62.5)	1 (12.5)	4 (50)	3 (37.5)

Source: Pediatric oncology. IMIP, 2021-2022.

Table 2 – CROSS TABULATION MTX INFUSION TIME. Pediatric oncology, IMIP, 2021-2022.

Score	MTX HOUR 42		Total	p-value
	<1	>1		
Degree of Mucositis				
Grade 1	3	3	6	0.3181
Grade 2 and 3	13	4	17	
<b>Total</b>	<b>16</b>	<b>7</b>	<b>23</b>	

1- Fisher's Exact Test

Source: Pediatric oncology. IMIP, 2021 -2022. 1.

Table 3 –DEGREE OF MUCOSITIS x CHIMES SCALE. Pediatric oncology, IMIP, 2021-2022.

Chimes Scale	Degree of Mucositis		Total	p-value
	1	2e3		
> 6.7	3	8	11	0.3181
<6.7	3	9	12	
<b>Total</b>	<b>6</b>	<b>17</b>	<b>23</b>	

1- Fisher's Exact Test

Source: Pediatric oncology. IMIP, 2021 -2022. 1.

## Results

- We analyzed 23 high-dose MTX cycles in 16 patients. They were divided according to the dose of MTX into 2.5 g/m<sup>2</sup> and 5.0 g/m<sup>2</sup>;
- Grades of OM 2 and 3 (OMS) were the most prevalent. In some cycles, there was a delay in MTX elimination at the 42 hours mark;
- The intensity of pain in patients with OM did not correlate with the severity of the oral injury;
- The highest hematologic toxicity was observed in cycles with 5.0 g/m<sup>2</sup> of MTX.



Figure 1. ORAL MUCOSITIS

## Conclusion

- The most severe OM occurred in cycles with higher doses of MTX, as well as greater hematological toxicity;
- Furthermore, it was observed that higher degrees of OM were obtained when MTX excretion was delayed;
- It appears that exposure of the oral mucosa to MTX can result in OM, regardless of the time of exposure to the drug and time of excretion;
- The excretion time seems to have a greater impact on the patient's systemic health.

## References

