



Assessment of Children Exposed to Maras Powder Intoxication

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Abstract

Introduction: A smokeless tobacco known as Maras powder (MP) is commonly consumed in the southern region of Turkey. To the extent of our knowledge, no previous study in literature has reported acute MP intoxication in children.

Aim: Our aim was to determine the clinical effects and treatment strategies of MP poisoning in children.

Materials and methods: We retrospectively reviewed the medical records of children <18 years of age with MP intoxication who were followed up in the Intensive Care Unit between January 2016 and April 2018 in our center.

Results: Forty-one patients (M/F= 25/16) were included in this study. The mean age was 13.2±22.4 months (age range: 7 to 30 months). The patients presented with vomiting (n=23, 56%), cough (n=17, 41.5%), loss of consciousness (n=11, 26.8%), respiratory distress (n=6, 14.6%), convulsion (n=7, 17%), cyanosis (n=1, 2.4%), and abdominal pain (n=1, 2.4%) following oral ingestion of the substance. On their physical examination all patients with convulsion were in a comatose state. Thirty-two patients (78%) had tachycardia; 15 patients (36.5%) had pharyngeal hyperemia; and three (7.3%) had hiccups. Although the female patients had a lesser rate of symptoms than male patients, the difference was not statistically significant.

Conclusions: Our aim was to inform the doctors about the clinical picture that develops after taking this substance and contribute to the understanding of the treatment approach.

Keywords

children, cure, intoxication, Maras powder

INTRODUCTION

A smokeless tobacco known as Maras powder (MP) is commonly consumed in the southern region of Turkey. It is extracted from a tobacco plant known as *Nicotiana rustica* Linn. Its nicotine concentration is 8 to 10 times

higher than regular cigarettes.¹ MP intoxication is not uncommon in the regions mentioned above in comparison to the rest of the country and the world. To the extent of our knowledge, no previous study in literature has reported acute MP intoxication in children. So, we aimed to investigate the clinical effects and treatment strategies of MP poisoning in children.

MATERIALS AND METHODS

We retrospectively reviewed the medical records of children <18 years of age with MP intoxication who were followed up in the Intensive Care Unit between January 2016 and April 2018 in our center. Follow-up for intoxication monitoring, and disease surveillance was performed according to specific protocols or local standard of care guidelines. We retrieved detailed demographic and clinical data including age, gender, presence of clinical signs and symptoms, and treatments provided. Lack of an identified toxin was an exclusion criterion. Research ethics approval was obtained from our institutional board.

Statistical analysis

Study data were analyzed by SPSS (Statistical Package for Social Science) 23.0 software package. Statistical analyses were performed using Chi-squared test and Mann-Whitney U test. Regression analysis was used to assess the association between physical examination findings and several outcome parameters. The level of significance was set at $p < 0.05$. The Ethics Committee of the School of Medicine of the Kahramanmaraş Sutcu Imam University approved the study. All persons and caretakers gave their verbal informed consent prior to their inclusion in the study.

RESULTS

Forty-one patients (M/F= 25/16) were included in this study. The mean age was 13.2 ± 22.4 months (age range: 7 to 30 months). The patients presented with vomiting (n=23, 56%), cough (n=17, 41.5%), loss of consciousness (n=11, 26.8%), respiratory distress (n=6, 14.6%), convulsion (n=7, 17%), cyanosis (n=1, 2.4%), and abdominal pain (n=1, 2.4%) following oral ingestion of the substance. On their physical examination all patients with convulsion were in a comatose state. Thirty-two patients (78%) had tachycardia; 15 patients (36.5%) had pharyngeal hyperemia; and three patients (7.3%) had hiccups. None of the patients needed mechanical ventilation or administration of an inotropic agent. Whole blood counts showed

mean hemoglobin (Hb) level of 10.8 ± 1.3 g/dl, a white blood cell count of 12200 ± 4135 /mm³, and an absolute lymphocyte count of 7933 ± 3329 /mm³. Blood chemistry results were as follows: mean blood glucose 114 ± 32 mg/dl, mean BUN 29.3 ± 4.4 mg/dl, mean creatinine 0.26 ± 0.04 mg/dl, mean AST 31.7 ± 6.9 U/l, mean ALT 16.1 ± 4.1 U/l, mean INR 0.97 ± 0.07 . Gastric lavage and active charcoal were given as needed in symptomatic patients (with an unreliable history). Convulsions were treated with anti-convulsants, and respiratory distress with nasal oxygen. We did not know whether the caretaker decontaminated patients' mouth. Although the female patients had a lesser rate of symptoms than male patients, the difference did not reach statistical significance (Table 1). Neither male gender nor pharyngeal hyperemia and hiccups were risk factors for severe symptoms (respiratory distress, loss of consciousness, convulsion). The mean duration of hospitalization was 2.2 ± 1.2 (range 1-4) days. All patients were discharged with cure.

DISCUSSION

In the present study, we retrospectively analyzed a group of pediatric patients with MP intoxication. In these patients, symptom resolution occurred within hours to days after oral administration of MP. Our patients were relatively young with male preponderance. A detailed history should be definitely obtained from the parents regarding substance intake before commencing treatment. Additionally, close patient monitoring for symptoms should be undertaken during hospital stay. Previous studies have shown that MP has adverse effects on cardiovascular system, albeit with chronic usage.^{2,3} Several studies have reported that MP may lead to arrhythmias such as paroxysmal atrial fibrillation.⁴ Although MP is related to cardiovascular risk factors³, none of our patients developed severe cardiovascular symptoms (tachycardia, arrhythmia). Cigarette smoking has been correlated with insulin resistance. It may be explained by increased levels of noradrenaline and counter regulatory hormones, such as growth hormone or cortisol.^{5,6} In our study, we did not find any significant alteration in blood glucose levels of the

Table 1. Comparison of signs and symptoms in mean of genders

	Male (n=25)	Female (n=16)	p value
Respiratory distress n (%)	5 (20)	1 (6.25)	0.224
Loss of consciousness n (%)	8 (32)	3 (18.7)	0.350
Convulsion n (%)	5 (20)	2 (12.5)	0.533
Vomiting n (%)	15 (60)	8 (50)	0.529
Cough n (%)	12 (48)	5 (31.25)	0.288
Pharyngeal hyperemia n (%)	9 (36)	6 (37.5)	0.933
Hiccup n (%)	2 (8)	1 (6.25)	0.834
Cyanosis n (%)	0	1	

patients. In a similar study, MP use did not affect blood sugar concentrations.³ It was reported that tobacco a negative effect on both the cellular and humoral immunity. However, the mechanism of the negative effects could not yet be explained clearly. A number of studies carried out to find out the possible effects of cigarette smoke on lymphocytes reported leukocytosis accompanying the increase in all lymphocytes.² We also found lymphocytosis ($>3000/\text{mm}^3$) in our study population.⁷ Six (14.6%) patients developed respiratory distress. Actually, a recent study has suggested that MP does not provoke serious bronchial obstruction.⁸ This may be due to the use of the smokeless tobacco through buccal mucosa but not through inhalation as in cigarette smoking. Respiratory distress in our patient may have been caused by aspiration. Hence, decontamination with water is an important intervention and should be applied as the first intervention. We do not know whether the caretaker of the children decontaminated their mouth. This is the first study ever investigating MP intoxication rate among pediatric patients in Turkey. Although serious events or fatal overdoses of this agent have rarely been reported, the most literature information is about chronic use and effects of the substance in adults. Our aim in this study was to inform the doctors about the clinical picture that develops after taking this substance and contribute to the understanding of the treatment approach. Efforts should be made to increase public awareness about MP intoxication to prevent further accidents

Competing Interests

The authors have no competing interests to declare.

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Оценка состояния детей, подвергнутых интоксикации порошком Maras

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Резюме

Введение: Бездымный табачный продукт, известный как порошок Maras (ПМ), часто употребляется в южной части Турции. Насколько нам известно, ни одно из предыдущих исследований не сообщало об острой интоксикации ПМ среди детей.

Цель: Нашей целью было установить клинические эффекты и терапевтические стратегии при отравлении ПМ среди детей.

Материалы и методы: Мы провели ретроспективный анализ медицинских карт детей в возрасте до 18 лет с интоксикацией ПМ, которые проходили лечение в отделении интенсивной терапии в период с января 2016 года по апрель 2018 года в нашем центре.

Результаты: В исследование был включен 41 пациент (М / Ж = 25/16). Средний возраст составлял 13.2 ± 22.4 месяца (в диапазоне – от 7 до 30 месяцев). Пациенты поступили со следующими симптомами – рвота (n = 23, 56%), кашель (n = 17, 41.5%), потеря сознания (n = 11, 26.8%), дыхательная недостаточность (n = 6, 14.6%), судороги (n = 7, 17%), цианоз (n = 1, 2.4%) и боль в животе (n = 1, 2.4%) после перорального приёма вещества. При физикальном обследовании все больные с судорогами пребывали в коме. Тридцать два пациента (78%) страдали тахикардией; у 15 пациентов (36.5%) была установлена гиперемия глотки, а у трёх (7.3%) – икота. Хотя у пациентов женского пола частота симптомов была ниже, чем у пациентов мужского пола, разница не была статистически значимой.

Заключение: Нашей целью было информировать врачей о клинической картине, которая развивается после приёма этого вещества, и способствовать пониманию терапевтического подхода.

Ключевые слова

дети, лечение, интоксикация, порошок Maras
