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Successful Use of Lidocaine in the Management of Severe Flécaïne Poisoning Refractory to Conventional Treatment

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Abstract

Introduction: Intoxications with class Ic antiarrhythmics, such as flécaïne, are rare but potentially life-threatening. We report a case of severe flécaïne poisoning where the use of lidocaine, a class Ib antiarrhythmic, enabled effective management of refractory rhythm disturbances.

Methods: A 22-year-old female patient was admitted for voluntary flécaïne poisoning after ingesting 2 g. She presented with shock, ventricular fibrillation, and torsades de pointes refractory to conventional treatment (cardioversion, magnesium sulfate, bicarbonates, amiodarone).

Results: After initial treatment failure, a lidocaine loading dose successfully resolved refractory ventricular rhythm disturbances. Continuous administration of lidocaine subsequently stabilized the patient's hemodynamic status and reduced the need for vasopressors.

Discussion: While the use of lidocaine is traditionally contraindicated in poisoning with class Ic antiarrhythmics due to the risk of drug interactions, this case demonstrates its potential value in refractory situations. Lidocaine may have a competitive effect on sodium channels, thereby reversing the toxicity of potent inhibitors such as flécaïne.

Conclusion: In severe flécaïne poisoning refractory to conventional treatment, the use of lidocaine can be a life-saving therapeutic option when extracorporeal clearance techniques are not available.

Keywords: Flecainide Poisoning, Refractory Arrhythmia, Lidocaine, Antiarrhythmic Drugs, Sodium Channel Blockade, Life-Saving Therapy

Introduction

Intoxications with class Ic antiarrhythmics, such as flécaïne, represent a serious and potentially life-threatening clinical situation. Flécaïne is a potent blocker of sodium channels, leading to a slowdown of sodium influx during phase 0 of the cardiac action potential. Its poisoning can result in rhythm disturbances ranging from bradycardia to ventricular tachyarrhythmias refractory to conventional treatment [1]. Despite the absence of a specific antidote, certain therapeutic approaches have been proposed, including the use of intralipid solutions, bicarbonates, and amiodarone [2]. However, in refractory cases, the use of extracorporeal clearance techniques such as ECMO may be necessary but is not always available [3]. Unexpectedly, the use of class Ib antiarrhythmics like lidocaine, traditionally contraindicated in this context, has shown potential interest in managing refractory rhythm disturbances related to flécaïne poisoning [4].

Case Report:

We report the case of Miss H.F., a 22-year-old female patient with a history of undocumented valvulopathy, who was admitted to the emergency department following intentional flécaïne poisoning in a suicide attempt. The patient was found unconscious on the floor with a box of flécaïne, omeprazole, and célécoxib by her mother. According to the mother, the presumed ingested dose of flécaïne was 2g (20 tablets of 100mg each).

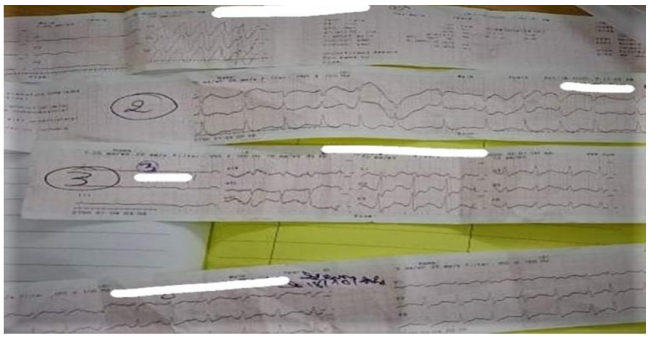
Upon admission, 1.5 hours after ingestion, the patient presented with shock and a blood pressure of 53/29 mmHg. During electrode placement, she experienced ventricular fibrillation followed by torsades de pointes, which resolved after the administration of 2g of magnesium sulfate prior to cardioversion.

Careful fluid resuscitation with 1 liter of isotonic saline, administration of lipid emulsion, and initiation of dobutamine at 2.08

µg/kg/min were undertaken. The electrocardiogram showed a widened QRS complex of 0.28 seconds with flattened P and T waves, necessitating the administration of bicarbonates and potassium.

Although stable for 6 hours, the patient subsequently developed hemodynamic instability, requiring the addition of norepinephrine up to 2.8 µg/kg/min, followed by adrenaline at 3 mg/h. Refractory ventricular tachycardia quickly developed, unresponsive to cardiopulmonary resuscitation and electrical cardioversion.

Only after the administration of a loading dose of lidocaine at 1.5 mg/kg, did the ventricular tachycardia resolve. Continuous administration of lidocaine allowed for a reduction in adrenaline and norepinephrine doses until definitive weaning on Day 3.



Images of the different ECGs performed on the patient

Discussion

Ce cas clinique illustre l'intérêt potentiel de l'utilisation de la lidocaïne, un antiarythmique de classe Ib, dans la prise en charge des intoxications sévères à la flécaïne, un antiarythmique de classe Ic, réfractaires au traitement conventionnel. Bien que l'utilisation concomitante de ces deux classes d'antiarythmiques ait longtemps été déconseillée en raison du risque d'interactions médicamenteuses, certaines études récentes remettent en question cette contre-indication dans les situations d'intoxication sévère.

L'étude de Siegers et al., publiée dans la revue Resuscitation en 2010, a suggéré l'utilisation de l'amiodarone comme traitement efficace de la fibrillation ventriculaire réfractaire induite par la flécaïne, ainsi que la lidocaïne dans le traitement des tachycardies ventriculaires soutenues et réfractaires, permettant ainsi d'éviter le recours à l'ECMO [5]. Ces résultats ont été renforcés par l'étude de Jung et al. publiée dans l'International Journal of Arrhythmia en 2016, qui a également souligné l'intérêt de la lidocaïne dans les intoxications à la flécaïne [6].

Bien que la lidocaïne soit également un bloqueur des canaux sodiques, il est admis que sa pharmacocinétique, notamment son effet "on/off", lui permet d'avoir un effet compétitif pour le canal sodique, inversant ainsi la toxicité d'autres inhibiteurs plus puissants des canaux sodiques, tels que les agents de classe Ic comme la flécaïne [7]. D'autres rapports de cas ont également identifié l'amiodarone ou le sulfate de magnésium comme des agents potentiellement efficaces dans le traitement des arythmies ventriculaires induites par la flécaïne [8, 9].

Bien qu'il n'existe pas de traitement standard pour les intoxications à la flécaïne, le cas rapporté ici démontre qu'une approche pharmacologique intensive, comprenant l'administration de bicarbonates de sodium, d'amiodarone, de sulfate de magnésium et de lidocaïne, peut s'avérer salvatrice dans les situations réfractaires, lorsque les techniques d'épuration extracorporelle ne sont pas disponibles.

Conclusion

This clinical case highlights the potential interest of using lidocaine, a class Ib antiarrhythmic, in the management of severe flécaïne poisonings refractory to conventional treatment. Although its use is traditionally contraindicated in this context due to the risk of drug interactions, lidocaine appears to have a competitive effect on sodium channels, counteracting the toxicity of potent inhibitors such as flécaïne. This intensive pharmacological approach, combining lidocaine, bicarbonates, amiodarone, and magnesium sulfate, can be life-saving when extracorporeal clearance techniques are not available. However, further studies are needed to better understand the mechanisms of action and establish clear recommendations for the use of lidocaine in this specific context. In the meantime, this therapeutic option should be considered cautiously in the absence of other alternatives.

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