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CLINICAL RESEARCH

Temporal trends in nitrate utilization for acute heart failure in elderly emergency patients: A single-centre observational study



Évolution temporelle de l'utilisation des dérivés chez les patients de plus de 75 ans admis aux urgences pour insuffisance cardiaque aiguë

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Heart failure;
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Nitrates;
Elderly;
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Summary

Background. – We previously conducted a pilot study that reported the safety of isosorbide dinitrate boluses for elderly emergency patients with acute heart failure syndrome.

Aims. – To assess the temporal trend in the rate of elderly patients treated with isosorbide dinitrate, and to evaluate subsequent outcome differences.

Methods. – This was a single-centre study. We compared patients aged > 75 years who attended the emergency department with a primary diagnosis of acute pulmonary oedema in the years 2007 and 2014. The primary endpoint was the rate of patients who received isosorbide dinitrate

Abbreviations: AHF, acute heart failure; APE, acute pulmonary oedema; ED, emergency department; ESC, European Society of Cardiology; ICD10, International Classification of Diseases, Tenth Revision; ICU, intensive care unit; ISDN, isosorbide dinitrate; IQR, interquartile range.

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boluses in the emergency department. Secondary endpoints included in-hospital mortality, need for intensive care and length of stay.

Results. — We analysed 368 charts, 232 from patients included in 2014 (63%) and 136 in 2007 (37%). The mean age was 85 ± 6 years in both groups. There was a significant rise in the rate of patients treated with isosorbide dinitrate between 2007 and 2014: 97 patients (42%) in 2014 vs. 24 patients (18%) in 2007 ($P < 0.01$). Comparing the two periods, we report similar in-hospital mortality rates (8% vs. 11%; $P = 0.5$), rates of admission to the intensive care unit (13% vs. 17%; $P = 0.3$) and lengths of stay (10 days in both groups).

Conclusion. — We observed a significant rise in the rate of elderly patients treated with isosorbide dinitrate boluses for acute heart failure. However, we did not observe any significant improvement in outcomes.

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MOTS CLÉS

Nitrés ;
Dinitrate
d'isosorbide ;
Insuffisance
cardiaque aiguë ;
Urgences ;
Gériatrie

Résumé

Contexte. — Nous avons publié précédemment une étude rapportant la sécurité d'utilisation du dinitrate d'isosorbide (ISDN) chez les patients de plus de 75 ans aux urgences.

Objectifs. — Évaluer l'évolution temporelle du taux de patients âgés traités par ISDN aux urgences pour œdème aigu pulmonaire (OAP), et l'impact en terme de pronostic.

Méthodes. — Étude monocentrique rétrospective. Nous avons comparé les patients de plus de 75 ans admis aux urgences pour OAP sur les années 2007 et 2014. Le critère de jugement principal était le traitement par bolus intraveineux d'ISDN. Les critères secondaires incluaient la mortalité hospitalière, l'admission en soins intensifs, et la durée d'hospitalisation.

Résultats. — Nous avons analysé 368 dossiers — 232 en 2014 (63 %) et 136 en 2007 (37 %). L'âge moyen était de 85 ans (écart-type 6) dans les deux groupes. Il y avait une augmentation significative du taux de patients traités par ISDN en 2014 : 97 patients (42 %) vs 24 (18 %) en 2007. La mortalité hospitalière, l'admission en soins intensifs et la durée d'hospitalisation étaient inchangées entre les deux périodes.

Conclusion. — Le taux de patients traités par ISDN a bien augmenté avec le temps, sans que nous n'ayons pu en montrer un impact pronostique.

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Background

Acute heart failure (AHF) syndrome represents 5% of all emergency hospitalizations [1], and is reported to be the most common discharge diagnosis from the emergency department (ED) in elderly patients [2–5]. Rates of rehospitalization and/or death at 60 days range from 30% to 50% [1]. Acute pulmonary oedema (APE) is characterized by an increase in capillary pulmonary pressures and tissue congestion, and its pharmacological therapy usually includes loop diuretics and nitrates. The value of these treatments lies in their potential to reduce congestion, through either vasodilatation or diuresis, which subsequently helps to decrease systemic vascular resistances and capillary pulmonary pressures. Since the pivotal studies by Cotter et al. [6,7], nitrates are recommended for the treatment of APE. The American Heart Association and the European Society of Cardiology (ESC) include the use of nitrates in their guidelines [8,9] for patients with systolic blood pressure > 110 mmHg [8]. Recently, this

treatment has been confirmed as first-line therapy by the ESC and the European Society of Emergency Medicine [10].

Although recommended by the ESC (grade IIA), nitrates are still insufficiently prescribed, as described in several studies [11–13]. A very low rate of elderly patients treated with nitrates was also seen in our previous retrospective study conducted in 2007 [14]. Of note, this study reported that isosorbide dinitrate (ISDN) as an intravenous bolus was safe in patients aged > 75 years presenting to the ED with APE.

Since the publication of our 2007 study, we have repeatedly highlighted the need for and safety of use of ISDN boluses for the treatment of elderly patients who present with APE in our ED; this was done by regular training sessions. The principal objective of this study was, therefore, to determine the effect of these training sessions on the use of nitrates by emergency physicians, by establishing the change in the rate of patients treated with ISDN in bolus form between 2007 and 2014. The secondary objective was

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