ABSTRACT

Treatment for digoxin poisoning using small, titrated doses of digoxin antibodies

Introduction

For acute digoxin poisoning, it has been recommended to give bolus doses of 10-20 vials or large doses calculated from dose ingested or the measured concentration. However, a recent revision of internal guidelines prompted the use repeated low doses of digoxin antibodies (Digoxin-Fab) based on clinical cardiac toxicity to become usual practice.

Methods

This is a prospective observational study of patients with acute digoxin poisoning identified through two Poisons Information Centres and three toxicology units. Patient demographics, symptoms of digoxin toxicity, doses and response to Digoxin-Fab, free and bound digoxin concentrations and outcomes were recorded and analysed.

Results

From September 2013 to September 2020, 23 patients with 25 presentations (median age 56 years, females 56%) were recruited. Initial median heart rate(HR) was 45 beats/min. Initial median digoxin and potassium concentrations were 14.5nmol/L (IQR:10.9-20) and 5mmol/L (IQR:4.5-5.4mmol/L) respectively. Gastrointestinal symptoms and acute kidney injury were present in 22 patients (88%) and 5 patients (20%) respectively. Four patients received an initial bolus dose of Digoxin-Fab of 5-20 vials. Twenty-one patients received repeated titrated doses (1-2 vials) of Digoxin-Fab and the median total dose was 4 vials (IQR:2-7.5). Median maximal change in HR post-Digoxin-Fab was 19 beats/min. The median potassium concentration decrease post-Digoxin-Fab was 0.3mmol/L. The total dose used in the titration group was 25% and 35% of the predicted doses based on the amount of digoxin ingested or measured serum concentration. Twelve had free digoxin concentrations measured. Free digoxin concentrations dropped to almost zero after any dose of Digoxin-Fab. Ten patients had a rebound of digoxin >2.6nmol/L(2μg/L). There were no deaths from acute digoxin toxicity.

Conclusions

The new practice of using small, titrated doses of Digoxin-Fab led to a considerable reduction in total usage and major savings. The clinical response to titrated doses was safe and acceptable in acute digoxin poisoning.

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介紹

對於急性毛地黃中毒，解毒劑建議給予10-20 瓶的推注劑量或是依患者所攝入的毛地黃劑量或血中毛地黃濃度來計算使用劑量。然而，近期修訂的內部指引提倡根據患者臨床心臟毒性症狀，使用重覆投予低劑量毛地黃抗體(Digoxin-Fab)的方式作為常用做法。

方法

這是一個前瞻性觀察型研究，急性毛地黃中毒患者是透過兩個毒物諮詢中心和三個毒理學單位所收錄。此研究將患者的人口特徵、毒性症狀、Digoxin-Fab使用劑量和給予後的反應、血中游離態及結合態毛地黃濃度及患者預後作記錄分析。

結果

從2013年 9 月到 2020 年 9 月，此研究共收錄 23 名患者資料(年齡中位數為56 歲，女性佔56%)。 初始心率中位數為 45 次/分鐘，血中毛地黃和血鉀的初始濃度中位數分別為14.5 nmol/L (四分位距:10.9-20 nmol/L) 和 5 mmol/L (四分位距:4.5-5.4 mmol/L)。在 22 名患者 (88%) 和 5 名患者 (20%) 分別出現了腸胃道症狀和急性腎損傷。其中四名患者投予 5-20 瓶初始推注劑量的Digoxin-Fab，21 名患者投予重複調定劑量的Digoxin-Fab(1-2 瓶)，總投予劑量中位數為 4 瓶(四分位距：2-7.5瓶)。投予Digoxin-Fab後心率的最大變化中位數為 19 次/分鐘，血鉀濃度降低的中位數為 0.3 mmol/L。在調定劑量組(Titration group)中總投予劑量是基於毛地黃攝入量或測量血中毛地黃濃度作為預測劑量的25% 和 35%。其中 12 人有檢驗血中游離態毛地黃濃度。投予任何劑量的Digoxin-Fab後，血中游離態毛地黃濃度幾乎降至零，但其中10 名患者血中毛地黃濃度後續反彈為 > 2.6 nmol/L(2μg/L)。此外，沒有因急性毛地黃中毒死亡的個案。

結論

在Digoxin-Fab的使用劑量上，使用小劑量且調定劑量的新做法顯著減少了解毒劑的總用量並節省了大量費用。在急性毛地黃中毒，此方式的臨床反應是安全且可接受的。