

Dosing of naloxone in opioid overdose outside of hospital.

Observational data 2014 -18 in Oslo, Norway

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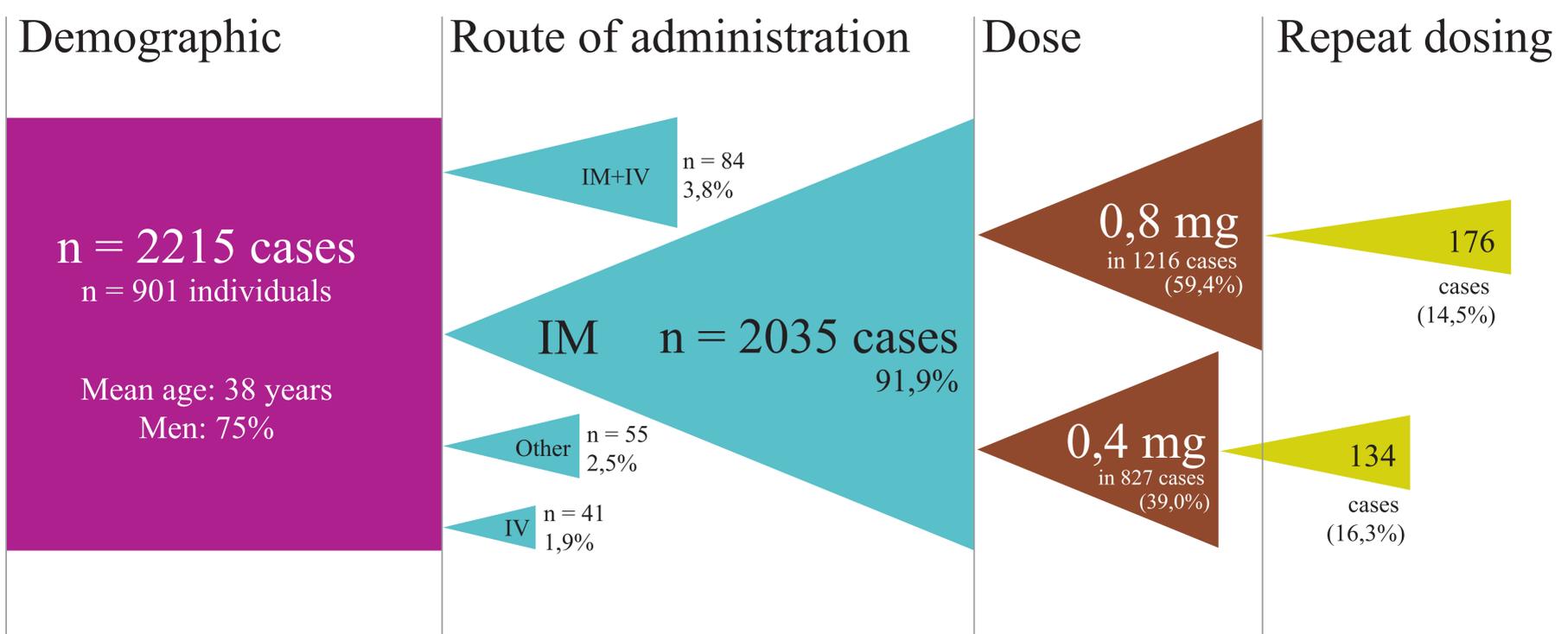
Background

Several different formulations of naloxone, approved and non-approved, are used in Take Home Naloxone programs. Formulations currently available were all approved on the basis of pharmacokinetic studies in healthy volunteers in which they were compared to 0.4 mg intramuscular naloxone. Questions have been raised if this comparing dose is too low, and that higher doses should be used. Such decisions should be supported by real-world data from naloxone use in opioid overdoses. This study describes the dosing of naloxone performed by ambulance staff in Oslo, who administer naloxone based on clinical evaluation, Glasgow Coma Scale (GCS) and respiratory rate.

Methods

Patients treated with naloxone by ambulance staff based at the Oslo City Centre Ambulance Station between 2014 and 2018 were included. Patients were given written information and the opportunity to withdraw from registration. Data collected from ambulance medical records were manually entered in a database based on pre-defined criteria. Missing data was not imputed. Source data verification of key variables was conducted. Data were analysed in STATA 15.1. The study was approved by the Regional Ethics Committee.

Results



We recorded 2215 cases of naloxone administration. 901 unique patients were registered with 1751 events, and 464 cases were registered anonymously. 75% were males and their mean age were 38 years. Respiratory rate was median 7 (SD 5.9) breaths/min and GCS=3/15 (4.5).

In 2035 cases (91.9%) intramuscular (IM) naloxone was given as first treatment. 41 cases (1.9%) got intravenous (IV) naloxone, and 84 cases (3.8%) were treated with both IM + IV naloxone. 55 cases (2.5%) received naloxone by other administration forms. 331 cases (14.9%) were treated with a second dose of naloxone. Only 63 cases (2.8%) needed three or more doses of naloxone.

Among those treated with IM naloxone, the initial dose was 0.4 mg in 827 cases (39.0%) and 0.8 mg for 1216 (59.4%) of the patients. Only 4 cases (0.2%) had a starting IM dose higher than 0.8 mg. Repeated administration were needed in 134 cases (16.3%) of those with an initial dose of 0.4 mg naloxone, and in 176 (14.5%) of those with an initial dose of 0.8 mg naloxone. In all, 87.6% received in total 0.8 mg naloxone or less. Less than 5% were given more than 1.2 mg naloxone. One patient had cardiac arrest and died during ambulance treatment. 12.9% were taken to hospital, 28.1% were followed up by primary care, 57.1% left at the scene and 1.1% received other follow up.

Conclusion

Intramuscular naloxone was the primary route chosen for treating opioid overdoses in Oslo, Norway. IM naloxone 0.8 mg is the most common dose used, providing successful reversal in most cases. Based on our findings, 0.8 mg naloxone IM should be used as comparator in studies of new treatment options in the field of opioid overdose.