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| **End-tidal carbon dioxide in asthma severity assessment: A systematic review** |
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| **Introduction/Aim:**  Accurate severity assessment of acute asthma exacerbations is vital to guide management and disposition of the patient. End-tidal carbon dioxide (EtCO2) has been proposed as a real-time measure for this purpose. This study aimed to systematically review literature on EtCO2 measurement in assessing the severity of acute asthma exacerbations.  **Methods:**  Electronic searches were conducted in five databases for literature related to asthma and EtCO2, capnography or capnometry (PROSPERO CRD42022366536). Studies on patients of any age with acute asthma exacerbations and at least one clinical outcome measure were included. Studies on intubated patients and outpatients were excluded. Two independent reviewers screened abstracts, then full texts for eligibility.  **Results:**  The database searches identified 1242 records and 11 studies were included in the review. 8/11 (73%) of studies had high risk of bias in patient selection, with most using convenience sampling. Five studies assessed the predictive power of EtCO2 for determining admission or discharge from the emergency department. Patients with lower initial EtCO2 were more likely to require hospital admission, and this result was significant in two of these studies. Other components of the capnograph waveform were associated with disposition, including a larger initial alpha angle and a lower ratio between phase III duration and respiratory rate being associated with hospital admission. Four studies reported correlations between EtCO2 and other markers of airway obstruction such as PEF, with correlations between 0.2 and 0.4 reported. Three studies reported a change in EtCO2 and other capnography measures after treatment.  **Conclusion:**  Lower EtCO2 may predict poorer outcome in acute asthma exacerbation. Certain other measures taken from the capnography waveform appear to be useful indicators of severity. Addressing patient selection issues and conducting prognostic accuracy studies of EtCO2 against other conventional biomarker may provide meaningful evidence for clinical practice. |