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SHORT REPORT

Chronic disease management in emergency department patients presenting with dyspnoea

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Abstract

Objectives: Guideline recommended treatments for chronic conditions are thought to reduce ED presentations.
Method: We used data from 1958 ED patients with dyspnoea to describe medication use in patients with chronic conditions.
Results: A total of 1233 (63.5%) patients had one or more of: chronic obstructive pulmonary disease 547 (28%), asthma 454 (23%), atrial fibrillation 368 (19%) or heart failure 401 (21%). Approximately, 70% were prescribed appropriate preventative medication for their chronic condition when they presented to ED with dyspnoea.
Conclusion: Prescription of guideline recommended therapies for chronic conditions in patients presenting to the ED in Australasia with acute dyspnoea is similar or higher than reported previously.

Key words: *chronic disease, drug therapy, dyspnoea, emergencies, preventative medicine.*

Introduction

Clinical practice guidelines inform therapeutic decision-making for management of chronic medical conditions including chronic obstructive pulmonary disease (COPD), asthma, atrial fibrillation (AF) and heart failure (HF) (Tables S1,S2). These guidelines aim to promote uptake of evidence-based practice to optimise patient care and improve quality of life, reduce ED attendances and reduce hospital admissions.

There is limited data regarding medication use in patients with these chronic conditions presenting to the ED. Data from our large study of patients attending ED with dyspnoea as a main symptom[1] afforded us the opportunity to explore chronic medication use in the sub-group of that population with the defined chronic conditions. The aim of this study was to describe routine medication use in patients presenting to ED with dyspnoea with COPD, asthma, AF or HF.

Methods

This was a sub-study of a prospective, international cohort study undertaken in 2014, with methods previously reported.[1] Ethics approvals were obtained for all sites according to local requirements.

Outcomes of interest and analysis

The primary outcome was the proportion of patients receiving guideline recommended preventative pharmacotherapy. The secondary outcome was the reason for presentation to ED. The analysis was descriptive, using SPSS v25 (IBM Corporation, Armonk, NY, USA).

Results

Table 1 shows the demographics, comorbidities, medication use and

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reason for ED presentation. The mean (95% confidence interval) age was 65 (64–66) years and 54% (52–56%) were female. Comorbidities were common, with 1233 of 1958 (63.5%) having more than one chronic condition. Appropriate preventative treatments were prescribed for 400 of 547 (73%) COPD, 273 of 454 (60%) asthma, 270 of 368 (73%) AF and 372 of 401 (93%) HF patients. The full list of medications for each group is shown in Tables S1 and S2. Approximately half of the time, people with a known chronic condition presented with an exacerbation of that condition. The other reasons for presentation with acute shortness of breath in this cohort were mostly due to an exacerbation of one of the other chronic conditions studied, or respiratory tract infections (20%), as shown in Table 1. Other causes of shortness of breath were uncommon. These included acute coronary syndromes (49), pulmonary embolism (33), anaemia (28), interstitial/other chronic lung disease (19), malignancy (19), non-respiratory sepsis (17), pneumothorax (14), allergy (14), and drugs/toxins (10).

Discussion

Compliance with guideline recommended therapy for chronic conditions for patients presenting to the ED in Australasia with acute shortness of breath was similar or higher in 2014 than that reported previously. Three quarters of patients with COPD were on preventative treatment, at the high end of rates reported in other studies (Tables S1, S2). Three quarters of patients with a history of AF were on rate control medication. Although lower than rates from an AF registry study in Korea,[2] this is not unexpected given our cohort was an unselected group of AF patients. Two thirds of AF patient were on stroke prevention medications, which is higher than previously reported. Almost all HF patients were on treatment, which is higher than previously reported rates (Tables S1,S2).

Provider adherence to guidelines improves when providers are aware of the guideline and believe it applies to their patients.[3] Adherence is also improved when the guideline is clear, supported by management, implementation is resourced appropriately, feedback is given, and that there is teamwork and a commitment to quality improvement.[3]

Patient compliance with medication is complex. In some but not all settings, beliefs about health, treatments, cultural influences, patient-prescriber relationships, and perceptions of illness control were important.[4]

A systematic review of cost effectiveness studies across many chronic conditions found few studies and inconsistent evidence for the cost effectiveness of interventions to improve COPD/asthma and HF compliance.[5]

Although the current study suggests there may be some room for improvement in compliance for patients with chronic disease presenting to the ED with dyspnoea, it is unclear whether interventions would be beneficial or cost effective in this cohort of patients with respect to reducing subsequent ED presentations. Further research is recommended to determine whether this is the case and what role ED may have in this regard.

Limitations

As a retrospective study we were not able to confirm that patients were compliant with treatments prescribed, and the true compliance with long term medications may be lower than the prescription rate reported here. Our findings only relate to the cohort and time studied, so may not represent compliance in the wider community.

Conclusion

Our study found that prescriptions for guideline recommended therapy for chronic conditions for patients presenting to the ED in Australasia with acute shortness of breath was similar or higher in 2014 than reported previously.

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TABLE 1. *Demographics, co-morbidities, medications and reason for ED presentation*

	COPD	Asthma	Atrial fibrillation	Heart failure
n	547	454	368	401
Demographics				
Age (median, IQR)	75, 65–82	57, 38–73	81, 70–87	80, 69–88
Sex (*n* male, %, 95% CI)	298, 54, 50–59	159, 35, 31–46	193, 52, 47–58	206, 51, 46–56
Co-morbidities (*n*, %, 95% CI)				
Hypertension	310, 57, 52–61	170, 37, 33–42	239, 65, 60–70	261, 65, 60–70
Ischaemic heart disease	194, 35, 31–40	77, 17, 14–21	145, 39, 35–44	206, 51, 46–56
Dyslipidaemia	210, 38, 34–43	104, 23, 19–27	167, 45, 40–50	183, 46, 41–51
Diabetes	138, 25, 22–29	88, 19, 16–23	111, 30, 27–35	162, 40, 36–45
Smoker (active/recent)	120, 22, 19–26	89, 20, 16–24	32, 9, 6–12	39, 10, 7–13
Heart failure	164, 30, 26–34	56, 12, 9–15	179, 49, 44–54	–
Atrial fibrillation	118, 21, 18–25	45, 10, 7–13	–	179, 45, 40–50
COPD	–	86, 19, 16–23	118, 32, 28–37	164, 41, 36–46
Asthma	86, 16, 13–19	–	45, 12, 9–16	56, 14, 11–18
Prescribed medications (*n*, %, 95% CI)				
Any heart failure medication	384, 70, 66–74	186, 41, 37–46	323, 88, 84–91	**372, 93, 90–95**
Any rate control medication	249, 45, 41–50	113, 25, 21–29	**270, 73, 68–78**	270, 67, 63–72
Long-acting anticoagulant	97, 18, 15–21	47, 11, 8–14	**199, 54, 49–59**	128, 32, 28–37
Any respiratory preventer	**452, 83, 79–86**	**368, 81, 77–84**	160, 43, 39–49	187, 47, 42–52
Respiratory preventer (excluding B-agonist)†	**400, 73, 69–77**	**273, 60, 56–65**	141, 38, 33–43	156, 39, 34–44
Primary diagnoses for ED presentation (*n*, %, 95% CI)				
COPD acute exacerbation	**274, 50, 46–54**	52, 12, 9–15	49, 13, 10–17	66, 16, 13–20
Asthma acute exacerbation	12, 2, 1–4	**190, 42, 37–46**	9, 21–5	8, 2, 1–4
Atrial fibrillation	7, 1, 0–3	7, 1, 0–3	**22, 6, 4–9**	8, 2, 1–4
Heart failure acute exacerbation	75, 14, 11–17	34, 7, 5–10	144, 39, 34–44	**188, 47, 42–52**
Respiratory infection	100, 18, 15–22	102, 22, 19–27	76, 21, 17–25	65, 16, 13–20
Other	79, 14, 12–18	69, 15, 12–19	68, 18, 15–23	66, 16, 13–20

†It was not known if the beta-agonist was short or long acting. ‡Some patients on dual antiplatelet agents. Bold font indicates treatment appropriate for the particular chronic condition or presentation due to the chronic condition as appropriate. CI, confidence interval; COPD, chronic obstructive pulmonary disease; IQR, interquartile range.

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Author contributions

PJ: design, recruitment analysis, manuscript preparation and revision. AMK: concept, design, recruitment, analysis, manuscript preparation. AH, GK, CAG, SC, WSK, SL: design, recruitment, refinement of manuscript. SK: design, data management, refinement of manuscript.

Competing interests

GK, SC and PJ are section editors for *Emergency Medicine Australasia*. AMK is a member of the Editorial Board of *Emergency Medicine Australasia*.

Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Supporting information

Additional supporting information may be found in the online version of this article at the publisher's web site:

Table S1. Medication use in patients with chronic conditions.
Table S2. Previous rates of compliance with medications in chronic conditions and relevant references.