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Hospital at Home: A Multidisciplinary Approach to Managing Frail Older Patients in the Community with COVID-19 Infection

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ABSTRACT

Background Hospital at home (HaH) teams are in a position to offer escalation of treatment in the communityfor frail older patients with COVID-19 infection to avoid potential adverse outcomes of hospitalisation. Torfaen Community Resource Team (CRT) is one such HaH team in South Wales. Objective To evaluate the outcomes ofpatients with COVID-19 infection managed by Torfaen CRT. Methods Prospective records were kept of all patients under the care of Torfaen CRT who received a nasopharyngeal PCR test for possible COVID-19 infection betweenMarch 2020 and March 2021. An audit was undertaken collecting data on test results, severity of COVID-19 infection, treatment given, elements of advanced care planning and outcome on discharge. Results 32 patients weremanaged under Torfaen CRT as positive for or likely COVID-19 infection. 24 patients (75%) were managed with moderate to severe COVID-19 infection. 16 (50%) patients were discharged having been successfully managed in the community, 13 (41%) were admitted and 3 (9%) died having been managed as being in the last stages of life. Fourweeks after discharge from our care, only 2 patients were admitted to hospital or re-referred to Torfaen CRT and no patients were diagnosed with VTE. Conclusions and Implications Half of patients with COVID-19 infection were successfully managed at home under Torfaen CRT. Here we discuss the framework used by our team to structure a multidisciplinary approach to manage these patients in the community and the need for robust evidence to guide management of patients with COVID-19 infection in this setting. Avenues for further research may includevalidating a HaH admission score for patients with COVID-19 infection and determining the evidence base for recommendations such as VTE prophylaxis and treatment with systemic corticosteroids in the community.

Keywords: COVID-19; Home; Hospital; Frailty; Community

Introduction

Hospital at Home (HaH) is defined by the British Geriatrics Society (BGS) as "a short term, targeted intervention that provides acute care at home, equivalent to the level of care that would be provided within the hospital. The model works best when it is part of an integrated acute and community based service led by experienced senior clinical decision makers working within a multidisciplinary team that has excellent links with other community services". The COVID-19 pandemic has highlighted the usefulness of such teams in providing an alternative to admission for frail older people as they aim to avoid "adverse outcomes from hospitalisation such as healthcare associated infections, falls and delirium" [1].

Torfaen Community Resource Team (CRT) is a Consultant Geriatrician led HaH team in South Wales. It was initiated as the Advanced Clinical Assessment Team in 2006 and is the oldest HaH service in the UK. In 2011, the existing nursing and medical teams were combined to form the current team. Here we present the results of an audit of frail patients with COVID-19 infection managed under our care during the pandemic. We go on to discuss current guidelines, highlight a paucity in the literature of robust evidence directly applicable to a community setting outside of primary care and make recommendations for future avenues of research.

Methods

Prospective records were kept of all patients under the care of Torfaen CRT who received a nasopharyngeal PCR test for possible COVID-19 infection between March 2020 and March 2021. Data was collected on test results, severity of COVID-19 infection [2], treatment given, elements of advanced care planning carried out and outcome on discharge.

Results

Of 76 patients who received a nasopharyngeal PCR test for COVID-19 infection during this period, 27 tested positive. Indications for swabbing included atypical presentations of COVID-19 in older people such as delirium, diarrhoea and lethargy [3]. 5 patients were managed as likely COVID-19 positive despite a negative result such as where there was recent close contact with a confirmed case. The average clinical frailty score was 6 with 4 patients in care homes. 24 patients (75%) were managed with moderate to severe COVID-19 infection. 12 patients were treated with antibiotics (the majority were started by the referrer) and 3 received at least one dose intravenously. 4 patients were given oral steroids, 4 were given intravenous fluids and 6 were assessed for home oxygen by the community Respiratory Specialist Nurse. 3 pa-

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tients were then started on home oxygen while under our care. In 5 cases, we put a Do Not Resuscitate form, Advanced Care Plan or Treatment Escalation Plan in place. 16 (50%) patients were discharged from our care having been successfully managed in the community, 13 (41%) were admitted and 3 (9%) died having been referred to the community palliative care team in 2 cases; home was documented as the preferred place of death (Table 1). After calculating time spent on our caseload for the patients not admitted to secondary care, we have saved a total of 173 bed days in the last year. Four weeks after discharge from our care, only 2 patients were admitted to hospital or re-referred to Torfaen CRT. No patients were diagnosed with VTE 4 weeks after our involvement.

	MILD	**MODERATE**	**SEVERE**	**CRITICAL**
Criteria	No evidence of hypoxia or pneumonia	Clinical signs of pneumonia but no signs of severe pneumonia	Clinical signs of pneumonia plus one of -RR >30 -severe respiratory distress -Sats <90% on A	Evidence of: ARDS Sepsis Septic shock
Can patient be managed safely at home by CRT?	Yes	Yes- if not at high risk of deterioration	Should be admitted if for escalation. Can manage at home if –EOL -not for admission -patient refuses and has capacity	Should be managed in ITU if for escalation. May benefit from admission for close monitoring, fluid resus and high flow oxygen. Can manage at home if -EOL -not for admission -patient refuses and has capacity
Monitoring	-Advise patient to contact CRT if unwell	-Daily telephone review and review in person if deteriorates -No need for routine monitoring of pulse oximetry at home	-Daily telephone review and review in person if deteriorates -Provide patient with pulse oximeter for daily sats measurement	-Daily telephone reviews. Face to face review only if deterioration in symptoms that cannot be managed virtually -No benefit from routinely monitoring pulse oximetry if
				not for escalation
Management	-Symptomatic management	-Abx only if bacterial infection suspected-Not for steroids	-Do CBG and consider oxygen at home up to 4L nasal cannulae -Abx only if bacterial infection suspected -Prescribe 7 to 10 days steroids	Consider -If already started, can continue oxygen for comfort -steroids+/-abx -Anticipatory medications -Referral to palliative care
CONSIDER VTE PROPHYLAXIS IF VTE RISK OUTWEIGHS BLEEDING RISK - At least for 14 days or until discharge (regardless of severity)				
ALL PATIENTS SHOULD BE GIVEN WORSENING ADVICE: - Call 999 if they develop sudden onset SOB, sudden drop in oxygen sats or chest pain				
DOCUMENT DISCUSSIONS REGARDING CEILING OF CARE USING ACCOMPANYING TEP DOCUMENT				

Table 1: Segment of proforma to guide management of patients with suspected or confirmed COVID-19 infection under care of Torfaen CRT based on disease severity

Discussion

The results of this audit demonstrate the multidisciplinary approach of Torfaen CRT to managing frail patients in the community with COVID-19 infection and half of the patients under our care have been successfully managed at home. Our approach to risk stratification, making monitoring plans and deciding on escalation of treatment has taken into account relevant guidelines and published research in order to develop a proforma specific to the resources available to our team.

The most recent NICE COVID-19 rapid guideline states that "the benefits and risks of hospital admission or other acute care delivery services (for example…HaH teams)" should be discussed with patients and their families [2]. Important recent recommendations that have implications for care delivered by HaH teams include pulse oximetry for remote monitoring where available [4], VTE prophylaxis after risk assessment (although no duration is specified) and initiation of oral corticosteroids in patients requiring oxygen therapy in a community setting.

NICE acknowledges that patients managed under the care of HaH teams have an increased risk of VTE similar to that of patients managed in hospital and consideration of VTE prophylaxis would ensure they receive equivalent care. Our proforma, therefore, now includes a prompt to consider VTE prophylaxis for at least 14 days or until discharge. This duration is based on the guidance for patients receiving inpatient treatment. NICE, however, also acknowledge that there is a lack of evidence to support this recommendation [2]. The incidence of VTE related to COVID-19 infection in the community is yet to be quantified and late cases of pulmonary embolism have been documented even after mild cases of COVID-19 infection managed in an outpatient setting [5]. Further clarification is needed on duration of VTE prophylaxis (NICE have made a specific recommendation that research is needed on extending VTE prophylaxis after discharge) and which patient groups are most likely to benefit.

Our proforma, however, already included recommendations to consider remote pulse oximetry monitoring and systemic corticosteroids. Systemic corticosteroids may reduce 28 day mortality and the need for invasive ventilation in patients with severe or critical disease with minimal harms demonstrated [6]. They are also "strongly recommended" by the WHO for adults with severe to critical disease [7]. Given that the majority of patients under our care with COVID-19 infection have moderate to severe disease and are unlikely to benefit from invasive or non-invasive ventilation, systemic corticosteroids may have survival benefit in those with an oxygen requirement and reduce the likelihood of a rapidly increasing oxygen requirement which would present challenges to effective management in the community. It goes without saying that, alongside this, robust and timely treatment escalation planning is essential.

The BGS has released a statement on research for older people during the COVID-19 pandemic [8]. One of its key recommendations is that there should be research into "how care homes and healthcare professionals, volunteers and community groups have worked together to manage the COVID-19 pandemic in the community." Regarding future treatments in the community, the Platform Randomised Trial of Interventions against COVID-19 in Older People (PRINCIPLE) trial is ongoing [9]. It aims to evaluate usual care alone compared to the addition of inhaled budesonide or colchicine in reducing the likelihood of hospital admission. At present, there is also no guidance for clinicians working in HaH teams deciding on which patients would most benefit from their care. A HaH team in Barcelona describes their experience looking after 63 patients with COVID-19 infection early in the pandemic [10]. They describe positive outcomes especially in cases of non-severe infection and highlight the fact that criteria for admission under their care was based on previous experiences of staff members with input from the Infectious Diseases team. They recommend that research be undertaken by larger studies with the aim of validating a HaH admission score for patients with COVID-19 infection.

A Cochrane review of the effectiveness and cost of care under HaH teams concludes that it "may provide an effective alternative to inpatient care for a select group of elderly patients requiring hospital admission. However, the evidence is limited by the small randomised controlled trials included in the review" [11]. Since then, the results of the first large multi-site randomised trial in the UK evaluating the effectiveness of Geriatrician led HaH interventions compared to hospital admission have been published. This study concluded that "admission avoidance HaH with CGA led to similar outcomes as hospital admission as well as a decrease in admissions to long term residential care at 6 months" [12]. It is worth noting the challenges in designing a study of this nature and applying its findings. The structure and approach of each HaH team varies by region depending on locally available resources such as staffing and links with other community teams [13]. In view of this, there will be challenges in developing agreed national targets or standards and developing guidelines specific to this setting. However, this should not serve as a deterrent to future research endeavours as the knowledge gained will enable clinicians and local policy makers to engage in well informed, evidence based decision making.

Conclusion

Torfaen CRT is a HaH team managing frail patients with COVID-19 infection in the community during the pandemic. Despite seeing a small number of cases with COVID-19 infection, our audit demonstrates the scope of interventions available to our team. Using a proforma facilitated a structured multidisciplinary approach and consistent communication which resulted in half of patients under our care being successfully managed at home. For this reason, other HaH teams may benefit from developing a proforma if not already in place. Although recommendations have been made by NICE, there remains a lack of robust evidence to guide management of these patients under HaH teams. In view of this, we suggest a number of avenues for further research including validating a HaH admission score for patients with COVID-19 infection and determining the evidence base for recommendations such as VTE prophylaxis and treatment with systemic corticosteroids in the community.

Abbreviations

Abx: Antibiotics; ARDS: Acute Respiratory Distress Syndrome; CBG: Capillary Blood Gas; CRT: Community Resource Team; EOL: End of life; ITU: Intensive Treatment Unit; L: Litres; RR: Respiratory Rate; SOS: Sats Oxygen Saturations; SOB: Shortness of Breath; TEP: Treatment Escalation Plan; VTE: Venous Thromboembolism

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