Emergency Oncology in the United Kingdom

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Introduction

In the United Kingdom (UK), over 350,000 new cases of cancer are diagnosed a year, contributing to around 28% of UK deaths [1]. In the UK, patients with cancer account for 15% of all acute inpatient stays and its delivery consumes nearly half of the spending on patients with cancer [2].

Cancer care has become increasingly specialised, and advances in therapy have resulted in a larger number of patients receiving care as an outpatient. As a result of these advances in care and the increasing number of patients receiving cancer therapies, there has been a significant increase in the number of patients presenting with unscheduled cancer-related emergencies [3].

The management of emergency oncologic patients presents many challenges. There are toxicities of targeted and immune therapies with which acute care physicians may not be familiar. Early recognition of acutely unwell cancer patients at risk of clinical deterioration is important not only to instigate treatment but also to facilitate decisions regarding whether escalation of care and cardiopulmonary resuscitation is appropriate [4]. This requires an understanding of the patient's underlying prognosis and goals of care, which often requires oncological advice.

In the UK, there have been two strategies adopted to improve the care of acutely unwell cancer patients – the development of specialist admission units in tertiary cancer units and the evolution of "acute oncologic services" to support patients admitted to non-cancer hospitals.

Acute Oncologic Services

In 2009, following a series of reports recognising that a significant proportion of cancer patients presenting to UK Emergency Departments (ED) received sub-optimal care, the UK National Chemotherapy Advisory Group (NCAG) recommended that every UK hospital with an ED established an acute oncologic service [5]. As a result of the varying demands and resources available across the UK to develop acute oncologic services at each hospital, there has been a wide range of models employed to deliver this strategy. The core of all acute oncologic teams has been an acute oncologic specialist nurse coordinating the service often supported by visiting oncologists.

The fundamental principles of an acute oncologic service are to promote education, awareness and early access to specialist oncologic input. It aims to drive integrated working between acute care physicians, surgeons, medical specialists and oncologists. Acute oncologic supports the variety of ED presentations from initial diagnosis, treatment complications and end-of-life issues. These encompass the three clearly defined types of acute oncologic presentation:

- Type 1 – Patients who present with a new diagnosis of cancer
- Type 2 – Patients who present with toxicities related to cancer treatments
- Type 3 – Patients who present symptoms and complications related to the cancer itself

Despite many national initiatives targeting early diagnosis of cancer in the UK, around a quarter of new cancers continue to be diagnosed during an emergency admission [6]. These patients traditionally were at risk of poorly coordinated care with late referrals to oncologic and palliative care services. Acute oncologic services have played a fundamental role in supporting the management of these patients and ensuring diagnostic pathways are completed in a timely fashion. This is especially pertinent in patients presenting

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with malignancy of unknown origin who often experienced fractured diagnostic journeys with lack of continuity and clinical accountability [7].

A yearly review of a regional network acute oncologic service covering seven hospitals in the North West of England reported 3013 new patient admissions, of which 19% were type 1 admissions, 30% type 2 and 51% type 3 [8]. Acute oncologic models reduced the length of inpatient hospital stays and delivered significant cost savings [8, 9].

Specialist Cancer Admission Units

Case Study

The Christie National Health Service (NHS) Trust is a tertiary oncologic hospital and is one of the largest in Europe. It has 250 beds including a 21-bed Oncologic Assessment Unit (OAU) and a 7-bed Critical Care Unit. It is the lead cancer centre for patients in Greater Manchester and Cheshire but provides many national services.

The OAU is a hybrid urgent care centre/observation unit based on the UK Acute Medical Unit (AMU) model of care, and 30–35% of patients are discharged directly with the rest admitted to downstream inpatient wards [10]. *The OAU does not admit patients with symptoms suggesting an acute cardiac event or those who may require emergency surgery. These patients are diverted to their local ED.*

A general AMU acts as a 24/7 hub for all emergency medical admissions to hospital and provides a gateway to medical specialties, including oncologic. Its core processes are similar to those in an ED including initial assessment by a competent clinician, early review by a senior clinician, diagnosis with early access to diagnostic tests, assessing and stabilising physiological instability (for a period of up to 48 hours), care delivered by a specialist multi-disciplinary team and triage to appropriate downstream wards if the patient requires an anticipated inpatient stay of greater than 48 hours.

The OAU currently admits around 450–550 patients a month. Patients are admitted to the unit through three main routes:

1. **Via *a hotline/paramedics*** *– All patients receiving treatment at The Christie have access to a specialist helpline, run by nurse specialists. Patients are advised that if they develop symptoms, such as fever post-chemotherapy, they contact the hotline for advice and assessment. If they are triaged as having a condition related to the cancer or its treatment, they are admitted to the admission unit for assessment. This is often facilitated by the hotline contacting an ambulance to transfer the patient to the hospital.*
2. **Via *inpatient clinics/chemotherapy/radiotherapy.***
3. **Via *referrals from other hospitals*** *– Patients under the care of The Christie or with an acute cancer presentation at another hospital who need urgent chemotherapy/specialist inpatient care are referred to The Christie and transferred to the admission unit.*

The OAU is staffed and supported by acute care physicians and advanced nurse clinicians with expertise in emergency oncologic presentations, medical and clinical oncologists, haematologists, supportive and palliative care physicians, visiting medical specialists with interests in complications of cancer therapy, experienced acute oncologic nurses and allied health-care professionals. This model facilitates timely and high-quality tertiary acute oncologic care with a focus on personalised emergency cancer care. It also facilitates innovations that are essential to the delivery of emergency oncologic care, such as triage nurse-led delivery of first-dose intravenous antibiotics in patients presenting with sepsis [11]. *One of the strengths of our centre is significant acute care physician and specialist experience in managing acutely unwell patients with immune-mediated toxicity alongside oncologic colleagues, as well as managing the multitude of medical presentations. This ensures high-quality outcomes for acutely unwell cancer patients.*

Ambulatory Care

Ambulatory care is recognised as a key tenet in ensuring the safety and sustainability of acute care services. The fundamental basis for ambulatory care is that patients presenting with acute illnesses can be stratified as low risk for developing complications and therefore do not require traditional inpatient care [12]. The NHS targets that 25% of all acute medical presentations are managed through this route.

There are an increasing number of acute cancer presentations that can be risk assessed for care in an emergency ambulatory setting. These include low-risk febrile neutropenia, incidental pulmonary embolism, cancer-associated DVT, chemotherapy-related acute kidney injury, chemotherapy-induced nausea and vomiting, indwelling line infections, acute management of pain crises, malignant hypercalcaemia and other electrolyte abnormalities, asymptomatic brain metastases and malignant pleural effusion [13–15].

Ambulatory models offer the opportunity to integrate palliative and supportive care with oncologic and acute services. Ambulatory enhanced supportive care models have shown utility in the management of low-risk febrile neutropenia [16]. This appears to facilitate improved access for patients to expertise in cancer care and immediate management of the complications of cancer treatment with the goal

of preventing downstream complications and future emergency presentations.

Modelling of ambulatory emergency oncologic services with integrated expert supportive and palliative care services is key for providing high-quality, personalised and sustainable emergency oncologic care. It enables a greater number of patients to have their cancer complications managed at their cancer treating centre and aims to reduce attendances at overcrowded general EDs.

UK Role in International Emergency Oncologic Research

The optimal medical management of many cancer-related emergencies is a key area for further research. Many practice patterns are based on expert opinion or prior experience rather than clinical trials. These include traditional presentations such as the management of opioid-related constipation and rescue therapy for chemotherapy-induced nausea and vomiting.

Prospective trials into the emergency management of immune-mediated toxicities of immune checkpoint inhibitors examining optimal doses of steroids for those presenting with life-threatening toxicities and the timing of steroid-sparing agents, such as infliximab, are essential. It is key that these studies are not only multi-national but supported by acute care physicians working in emergency oncologic settings.

The care model used for patients with oncologic emergencies needs to be tailored to the local medical and oncologic environment; therefore, it naturally follows that different medical systems have developed different processes to care for these patients. A key for successful emergency oncologic models is the underlying goal of care being provided to these patients by clinicians who are knowledgeable about their needs and have integrated communication with the primary oncologists. Acute care of the oncologic patient is gaining recognition as an important international area that could be improved upon with increased training, research and emphasis on integration into the oncologic system. International collaboration is needed to achieve this.

COVID19 and Acute Cancer in the UK

At the time of writing, the impact of COVID19 on emergency oncologic is unclear. The COVID19 pandemic has resulted in the redeployment of many acute oncologic staff into non-oncologic-based roles to help with its management. The impact and duration of these changes is not yet understood.

Furthermore, the outcomes relating to acutely unwell cancer patients with COVID19 and their optimal management is a new challenge for those working in emergency oncologic. Modelling so that patients with SARS-CoV-2 are not co-located with those without will have significant implications for the delivery and modelling of acute cancer services in the UK and internationally. The specialist cancer ER in Asan, Seoul, South Korea, has already been reconfigured to become an infectious diseases/COVID19 ER for the foreseeable future.

It is too early to speculate as to the long-term impact on emergency oncologic services of COVID19, but no current chapter relating to this subject would be complete without a brief caveat suggesting that significant changes in modelling may be necessary.

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