Introduction

Have we reached the end of the antibiotic era with the dawn of carbapenem producing organisms (CPO’s)? A London hospital’s recent experience has prompted more questions. If this is the future of what is to come then what do we need to know as infection prevention and control specialists? How do we convey the importance to hospital staff? Ultimately, what is the impact upon the patient and the implication of living with the threat of a possibly untreatable infection?

Improvement issue

A cluster of CPO cases were identified on a medical ward between January-March 2016. The index case who was in a single room with enhanced contact precautions. A second case was identified in an urology patient indicating colonisation; however no contact with the index case. The Infection Control Team (ICT) commenced screening of the adjacent bay and single room, initially weekly. A further case was identified and screening was extended to the ward.

During this surveillance, three further cases were identified but were not linked by genotyping. They would not have met the Public Health England (PHE) screening criteria(1), but had remained untested. The majority of the population on the ward were elderly, frail and had prolonged hospital stays due to the variety of complex social and other medical issues. The finding of this prompted the ICT to question how much of a threat undetected CPO’s pose.

During the surveillance period, it was recognised that there was a lack of awareness of CPO’s among the multi-disciplinary team. The organism was identified in the environment; it was isolated in the sink drainage hole and on the electronic prescribing and medication administration (EPMA) trolleys which traversed the ward. The PHE acute toolkit was used as guidance in the management of this cluster as well as a recent paper by Wilson et al (2016).

Context

Research about the rate of infection is scarce. In 2010, the European Centre for Disease Prevention and Control (ECDC) deemed the UK to have sporadic outbreaks. By 2013 there was evidence of regional spread (3). The strain, Klebsiella pneumoniae carbapenemase (KPC) demonstrated evidence of inter-regional spread and has been common in the UK.

Methods and measurement

In order to prevent the further transmission and to equip the staff with knowledge, education initiatives covering standard infection control precautions and the importance of CPO in an acute hospital setting.

To control the spread of infection, the patients underwent weekly screening until no new positive cases were identified. During this time, enhanced cleaning with disposable mops and cloths with a stronger 1:1 concentration of detergent was used. Samples were taken to examine the role of equipment and the environment in indirect transmission. The EPMA trolleys and plug holes of the hand wash basin isolated CPO’s from this practice was examined using the quality improvement tool (4).

Behaviour and practice were audited using the infection control quality improvement toolkit. Observation 1 was completed during the surveillance period when there were two patients with CPO on the ward. Observation 2 was completed a couple of months later to measure behaviour change. The first part measures compliance with infection control mandatory training where standard infection control precautions are covered. Questions about the isolation precautions, equipment and cleaning were asked in the knowledge section. Extra education on standard infection control precautions were provided by the ICT and clinical practice facilitator. The facilities prior assessed if there were adequate measures in place to appropriately care for the patient such as patient specific equipment. As part of the observation, staff were observed performing hand hygiene prior to donning appropriate PPE, keeping the door closed, draping oneself, using PPE and using the new EPMA trolleys.

References


Impact on the patient

Recurring themes affecting patients have arisen especially when preparing for safe and appropriate discharge.

Psychological isolation and boredom have been common features as often the patients have been locked so far to limit the room for any length of time. Rehabilitation of patients has posed many questions to the ICT as group activities and the use of shared patient equipment have had to be risk assessed on a case by case basis.

The length of hospital stay is increased due to difficulty in allocating patients to secondary care or nursing homes. These facilities often have limited knowledge and not enough single en-suite room capacity. National guidance proved difficult to translate into practice (5), the ICT gained a new understanding of the challenges of transferring patients to secondary care where single room facilities were scarce and the complex referral pathways.

Impact on staff

The ward staff in the settings of acute admission, general medical and infectious diseases were unfamiliar with caring for patients with CPO. While discussing the topic, therapy and nursing staff voiced concerns of fear over contracting a CPO infection. Concerns were raised around equipment, given the needs of the patient there was often only one piece of therapy equipment that was used for different patients. This provided challenges for the therapy team. Education focussed on the newly simplified cleaning wipes.

It was ascertain that staff were unfamiliar with cleaning practices and the process of enhanced cleaning. The fact that this complicated, resistant superbug could be controlled with ‘old fashioned’ standard precautions was a surprise to a few.

Evidence of improvement

The staff became more engaged in infection control practices as they became more familiar with the team. Their awareness of implications of practices were realised when the transmission was linked to either hands or equipment; this is evidenced in the changes in the quality improvement tool.

The ICT used hydrogen peroxide vapour cleaning for the single rooms as per the UCLH red, violet, amber, green cleaning tool. Additional measures to ensure environmental cleanliness were employed such as throwing away the pillows on discharge/transfer of a CPO positive patient.

The cleaning of equipment has had its importance reinvigorated with local data from the environmental swabbing. EPMA trolleys in each single room are now standard on the infectious diseases ward, and other wards are ordering more. A shortage of observation machines was also recognised and more have been put in place. The cleaning of equipment has been simplified by using Clinic universal (green) and sporicidal (red) wipes as a standard throughout the Trust to promote effective cleaning.

The promotion of enhanced cleaning where the room of a patient with CPO or C diff is cleaned twice daily with disposable mops and cloths and an increased concentration of detergent is used. Working with domestic staff, the ICT have created a checklist to ensure the process is carried out satisfactorily and so ward and domestic staff can monitor the standard. It was identified that clutter in single rooms was a problem, resulting in the rooms not being cleaned sufficiently.

Learning from the experience of the cluster of CPO was fed back to the multidisciplinary team at clinical governance. It is evident that more information about CPO is needed for ward teams, at present the Trust guideline is in draft format. The guidance is influenced by issues which have arisen while caring for patients. It has a practical approach to cleaning, leaving the isolation room and looking at the patient’s needs holistically. It also covers topics where there is no known guidance such as that of embalming a deceased patient.

Future steps

A review of protocols and procedures has commenced, including looking at cleaning practices throughout the organisation. The Trust guideline is in its final draft and provides checklists for the ward which focus on:

• Compliance with isolation procedure
• Risk assess leaving the single room for procedures, theatre and rehabilitation
• To monitor the processes of enhanced cleaning.

As part of the ICT’s programme this year of ‘Back to Basics’, teaching on standard infection control precautions have been rehauled. It is anticipated that with the guidance and tools, CPO teaching will become embedded in infection control clinical education to provide a practical and effective approach to this evolving healthcare threat.

From examining national guidance and sharing knowledge with local ICT’s such as the Royal Free and UCLH, there are similarities in experiences. A culture of sharing is essential to further understanding of this socially complex healthcare associated bacteria. It is acknowledged that communication needs improving, at a local level at handover and also to improve communication with GPs and other hospitals.