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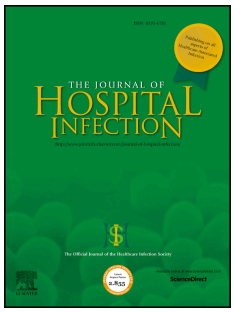

Multidrug resistant infections in the COVID-19 era, a framework for considering the potential impact

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Multidrug resistant infections in the COVID-19 era, a framework for considering the potential impact.

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Daniele Donà and Costanza Di Chiara wrote the first draft of the manuscript; Mike Sharland contributed to the critical revision of the manuscript. All authors also read and approved the final version.

Sir

The recent report by Jolivet *et al* highlights the progress being made on Multidrug-resistant (MDR) infections [1]. However, this report predates the COVID-19 pandemic and it is unclear what the impact will be on MDR infections globally. There are reports of a high use of broad-spectrum antibiotics in the hospital setting, recognised as a risk factor for hospital-acquired infections (HAI) with MDR organisms [2-4]. Recent data have also pointed to significant rates of hospital-acquired pneumonia (HAP) [2]. High rates of admission, shortages of staff and personal protective equipment (PPE) and high acuity patients with prolonged lengths of stay in overcrowded facilities may also impact on rates of HAI with MDR pathogens [2,3]. Moreover, severe COVID-19, which particularly affects elderly patients with multiple comorbidities, may be an important factor in determining changes of colonization pressure [2-4]. Equally, wider recognition of the importance of nosocomial infections, with stricter hygiene policies, high use of PPE, and patients being cared for in new temporary hospitals, could all mitigate against this threat [2,3]. We have tried to summarise in Table I the potential relative impact of these various factors to provide a conceptual framework for determining the overall impact [2-6].

Novel cost-effective surveillance programmes of MDR HAI in both high- and low/middle-income countries will be even more important in the post COVID-19 era, combined with enhanced stewardship interventions. These need to be planned for now, to facilitate future integration with any future pandemic surveillance.

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Table I. Potential Covid-19 impact on hospital transmission of multidrug-resistant organisms (MDRO)

	Factors that may favour MDRO transmission	**Factors that may prevent MDRO transmission**
Infection prevention & control practices and use of PPE	Shortage of PPE due to the rapid increase in people admitted with SARS-CoV-2 [3-5]	Isolation of COVID-19 patients, application of enhanced standard precaution (hand-hygiene policy and respiratory hygiene), use of PPE (when available), and appropriate environmental disinfection procedures [3-5]
Hospital overcrowding	The need for large-scale medical assistance exceeds hospital beds availability resulting in overcrowded facilities [3,6]	Lack of beds in ICUs has led to new facilities being developed both within and outside current hospital ICU settings, many with existing colonisation with MDRO's [3,5]
Healthcare workers (HCWs)	High rates of staff sickness and nosocomial acquisition of COVID-19 , leading to low HCW-to-patient ratio [3,5,6]	COVID-19 designed ICUs with dedicated HCWs may have decrease cross-transmission of nosocomial infections [3,4]
Demographic features of COVID-19 affected patients	Elderly patients with comorbidities require prolonged hospitalizations with mechanical ventilation support with high use of broad-spectrum antibiotics administration [2-4]	Lower rates of admission to hospital from long term care facilities may lead to less transmission cycles between long term care facilities and hospitals [2-4]