

Infectious Diseases Symposium

The Symposium was held on Wednesday 29 May 2013 at the Royal College of Physicians of Edinburgh.

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INTRODUCTION

Infectious diseases as a specialty continues to face extreme challenges. The changing geographical distribution of diseases due to economic migration, global mobility and the impact of climate change are posing an ever-increasing threat to human health. With the emergence of new pathogens and the re-emergence of 'old' ones, we are constantly having to update our investigation and management of infections. An ever-increasing number of drug-resistant pathogens and the threat to health from zoonosis make some of our existing treatment regimens redundant. And we must of course also consider the potential threats to biosecurity and natural pandemics.

To address the specific problems in the fight against infectious disease, a strong programme of speakers was assembled, of both national and international repute to update the audience on some of these topical issues.

SESSION 1 – HOW TO PROVIDE THE VERY BEST TREATMENT FOR COMPLEX INFECTIONS

Professor Kevin Rooney (Consultant in Anaesthesia and Intensive Care Medicine, NHS Greater Glasgow and Clyde) provided an overview of how previous efforts to improve outcome from sepsis have struggled to make significant and sustainable improvements and explained how evolving guidelines and local initiatives aimed at optimising the survival from sepsis are slowly having an impact.

The Surviving Sepsis Campaign published in 2013 highlights that prompt recognition and management of sepsis is imperative.¹ Mortality figures escalate from 15% with sepsis to around 50% with septic shock, killing over 37,000 people per year in the UK.¹ Early warning scoring systems and sepsis screening tools have since been implemented within Greater Glasgow and Clyde (Sepsis 6 pathway) as studies have proven time sensitive treatment within the hour significantly reduces mortality (with every hour's delay in antibiotic therapy leading to

24% more deaths).¹ Currently there are pilot studies looking at early warning scoring systems within primary care to further reduce mortality from sepsis and target patients earlier.

With an ever-increasing number of people with cancer, earlier diagnosis and more widely available access to novel anti-cancer therapies are also growing, as are the complications within this group. Dr Fiona Nussey (Consultant in Medical Oncology, NHS Lothian) outlined the current strategies being implemented within the Lothian area to improve the recognition and management of line infections and provide prompt treatment of neutropenic sepsis. Results of a recent local audit were discussed: Patients at risk of neutropenic sepsis are assigned to a risk category (standard and high risk) using a scoring system, which enables timely initiation of appropriate therapy. The use of granulocyte colony stimulating factor (G-CSF) and prophylactic ciprofloxacin was discussed in this patient group with current guidelines being presented.²

STANLEY DAVIDSON ENDOWED LECTURE – TOGETHER, WE CAN STOP HIV/AIDS

Professor Julio Montaner (Director of the British Columbia Centre for Excellence in HIV/AIDS, St Paul's Hospital, Providence Healthcare; University of British Columbia and St Paul's Hospital Foundation and Past President of International AIDS Society [IAS]) gave an inspirational overview of his current research into implementing the 'treatment as prevention' strategy in order to achieve an AIDS-free generation. He set the scene with an explanation of his work in the early 1990s and the development of highly active antiretroviral therapy (HAART) which has led to a dramatic decrease in morbidity and mortality among patients receiving treatment. Studies between 2004 and 2006 looking at the impact of HAART revealed a sharp reduction in HIV transmission within the population in general, in the setting of vertical transmission and the prevention HIV transmission among intravenous drug users.²

Studies from British Columbia have shown that greater access to HAART has resulted in a steady fall in new HIV diagnoses, with an associated decline in mortality and morbidity. On a global level, the new World Health Organization (WHO) treatment guidelines are due to be finalized in July and will recommend that globally, HAART treatment should be prescribed for individuals who have a CD4 count of up to 500 and co-infected patients should be treated regardless of count. An AIDS-free generation is within reach, however we need to be moving towards a universal 'test and treat all' strategy and capitalise on the promise of HIV treatment as prevention.

SESSION 2 – WHEN FIRST-LINE AGENTS ARE NOT ENOUGH

In response to the increase in the spread of *Clostridium difficile* (CDI) in 2008, there was a radical change in empirical antibiotic prescription guidelines across NHS Greater Glasgow and Clyde (GGC) hospitals. One of the leaders in this change of practice, Dr Andrew Seaton (Consultant in Infectious Diseases, Brownlee Centre, Glasgow), gave a personal overview on the current antimicrobial prescribing guidelines within GGC, a description of first-line antibiotic therapy and whether they do in fact work. Some unpublished work was presented which highlighted the reduction in *C. difficile* infections and gram-negative resistance levels following implementation of the strict guidelines. The role of the antimicrobial management teams was discussed and revealed the importance of individual patient management to ensure the optimisation of outcomes for patients without risking patient care or reducing efficacy.

PROGRESS IN THE FIGHT AGAINST BLOOD BORNE VIRUSES – HCV TREATMENT IN CLINICAL PRACTICE

Strong competition between major pharmaceutical players has accelerated progress in the development of new hepatitis C virus (HCV) therapies. Dr John Dillon (Consultant Hepatologist and Gastroenterologist, NHS Tayside) gave an update on the current treatment of HCV which is predicted to completely change in the next two years, with the emergence of new directly acting antivirals. The current genotype 1 treatment consists of a combination of boceprevir with pegylated interferon (peg-IFN) plus ribavirin or its competitor telaprevir, in combination with peg-IFN plus ribavirin. Studies reveal a very high 'cure rate' with these agents; however, side-effects remain a major issue. There are a large number of new drugs currently in the pipeline with the possibility of six more being licensed by the end of 2014. Hepatitis C virus (HCV) cure rates reached 70% in 2012 and are predicted to exceed 90% by 2014.³

SESSION 3 – PREVENTION AND CONTROL

With the current general immunization programme in the UK⁴ undergoing significant changes over the next few years, Dr Syed Ahmed (Clinical Director, Public Health Protection Unit [PHPU], NHS Greater Glasgow and Clyde) provided an extensive update on recent developments in immunisation. Prior to the introduction of the Meningococcus group C (Men C) vaccine in 1999, serogroup C was one of the common causes of meningococcal disease; cases fell by 71% following the introduction of the vaccine. The first change to the vaccination schedule is rescheduling of one of the primary Men C vaccine doses from four months old to giving it as part of the teenage booster instead, to maintain immunity.

The rotavirus vaccine is being introduced now (July 2013). There are over 55,000 cases of rotavirus annually in Scotland with a peak age of infection around ten months; and the vaccine will be given at age two and three months.

In September 2013, all 70-year-olds will be offered the shingles vaccine which has been shown to reduce the incidence of post-herpetic neuralgia by up to 66.8%.⁵ Changes to the current flu vaccination strategy will also be made in September 2013. Initial plans are to vaccinate all two and three-year-olds using a new live intranasal spray. This will then be widened to include all children aged 2–17 by 2015.

Following the recent Legionella outbreak in Edinburgh in 2012, Dr Duncan McCormick (Consultant in Critical Care, Royal Infirmary of Edinburgh) provided us with a detailed account of the epidemiological issues surrounding the episode. He gave a general overview of the infecting organism itself, the timeline of the outbreak, initial epidemiology and the rapid and comprehensive response which followed to bring it under control. The difficulty in trying to achieve a balance between informing the public without causing hysteria was challenging, particularly with the media attention that the outbreak received. With 55 confirmed cases, numerous 'possible' cases and a 4.3% overall mortality, there was a significant impact on NHS Lothian services.

Continuing the theme, Dr Michael Gillies (Consultant in Critical Care, Royal Infirmary of Edinburgh) gave a more clinical account of the outbreak from a critical care perspective. A significant proportion of cases (36%) required critical care treatment. Index cases were typically middle-aged men, smokers, with multiple co-morbidities. Atypical presentations of pneumonia and confusion tended to be a common feature. Hyponatraemia, as expected, was a common laboratory finding and in those admitted to the Intensive Care Unit

(ICU), acute kidney injury was a feature. Laboratory investigations confirmed the strain as *L. pneumophila* SgI Knoxville ST191. A clinical algorithm was implemented to guide therapy.

SESSION 4 – BUGS FROM ABROAD

With the growing concern at the governmental level about the emergence of antimicrobial resistance, Professor David Livermore (Professor of Medical Microbiology, University of East Anglia) gave an excellent account of the increasing problems associated with this rise. Travel has always spread disease but in the last century, the population has quadrupled and travel has accelerated which allows disease to spread more effectively. The problems were highlighted using data from worldwide cephalosporin-resistance in a globally successful strain of *E. coli* (mainly ST131) from bacteraemias, revealing an incidence of 10% in the UK, 50% in China but 80% in India. This is mainly due to spread of the CTX-M family of β -lactamases.⁶ Further globally successful strains of Enterobacteriaceae have led to the global spread of KPC, OXA-48 and 181, and more recently NDM-1.5 These extremely resistant organisms have posed a significant problem with the growth in 'medical tourism', during the repatriation of hospitalized patients and the subsequent spread within critical care environments.

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As well as spreading disease when they come home, travellers also commonly become unwell when travelling abroad. Professor David Laloo (Professor of Tropical Medicine at Liverpool School of Tropical Medicine) updated us on the presentation and management some of the problematic tropical infections brought back into the UK by travellers including malaria and chikungunya. We also need to remember that not all returning travellers have exotic or tropical diseases.

TAKE HOME MESSAGE...

We are living in a remarkable era. Almost all the major advances in understanding and controlling infectious diseases have occurred during the past two centuries. We live in a globalized world and unfortunately infectious agents benefit from this. Travellers have always managed to spread disease but this is posing an increasing threat, with the spread of treatment-resistant disease. Due to the evolutionary capacity of infectious pathogens to adapt to new ecologic niches created by human endeavor, as well as to pressures directed at their elimination, we will always confront new or re-emerging infectious threats. Our response to these challenges must continue to be vigorous.