INFECTIOUS DISEASES

Elective Report:

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Subject: Transplant Immunology, Immunogenetics and Infectious Diseases

Explore the types of organ transplantation that are carried out on patients in India and how these compare to patients in the UK;

By far the most common solid organ transplanted worldwide is the kidney. In India, renal failure requiring dialysis or transplantation affects up to 1.4% of the population (which is a huge number considering the size of the population). There are an estimated 1.5 million people with end stage renal failure (ESRF), and only 10% of these patients are thought to be receiving life-prolonging treatment. Chronic Glomerulonephritis is the leading cause of ESRF in India (affecting 33% patients). Diabetic nephropathy is another major cause of ESRF, affecting 20% of patients. This latter group is expected to grow as the incidence of Type 2 Diabetes increases as a result of the country's improved economy and over-nutrition. The median age of ESRF patients in India is also significantly lower than is found in the UK; 44 years compared to 63 years in the UK. This is thought to be due to an overall failure in the healthcare system to diagnose renal failure early, and also to provide many of these patients with effective treatments to slow down the inevitable disease progression. There are around 3,000 renal transplant surgeries carried out every year in India, which benefits a mere 2% of the eligible patients. While there are several reasons for this, it appears to be a partly related to a deficiency in the number of cadaveric organs and a reluctance of the Indian population to donate organs in life and after death.

Compare the structure of the UK healthcare system to that in India;

The British healthcare system that we are all familiar with is state funded and delivered by a National Health Service. Its main founding principle was that healthcare to the British people was free at the point of delivery. There are few, if any other countries in the world that provides such comprehensive health cover and at no immediate cost to the individual. In the vast majority of other countries, individuals pay directly for all healthcare issues. This is certainly the case in India.

In 2013, the population of India was estimated at 1.27 billion. Regarding the availability of healthcare, the population can be crudely separated into 2 groups;

the upper and middle classes, who have access to high quality care with the vast (and growing) number of private hospitals. The second group are the majority of the population, who live 'below the poverty line' and generally in rural areas. For this group, accessing healthcare is very hard owing to the inadequacy of government hospitals and medical and nursing staff. Of equal importance is the inability of the poor to afford medical treatment even though most drug therapy is heavily subsidised. Medical insurance is easily beyond their means. The World Health Organisation ranked India's healthcare system 112th out of 190 countries in their global healthcare profiles in 2000. Foremost among their concerns were those relating to the poor standard of sanitation and high prevalence of fatal diseases like malaria, TB and diarrhoea. Additionally, they found India to have the highest percentage of underweight children below 5 years old (43.5%) among the 190 countries assessed. The life expectancy in India is currently 63 years for males and 66 years for females. Compared to the UK, alternative medicine such as Ayurveda and Homeopathy are widely acknowledged and practiced. A possible reason for this could be their lower costs and increased availability compared with conventional medicine. They are also more frequently advertised in the media and even endorsed from time to time by Indian celebrities.

Learn about the common presentations of patients with infectious diseases in India and appreciate the challenges in delivering healthcare in India;

Cases of Tuberculosis (TB) in India make up around one fifth of the world's total mycobacterial disease burden. Surprisingly, TB was only declared a notifiable disease by law as recently as May 2012.

There are several features of tuberculous infection in India that challenges the healthcare system, and which represent major obstacles in disease identification, treatment and prevention. These include the poor nutritional status of the majority of patients, which by subtly impairing the immune system, leads to unusual modes of presentation with frequent widespread dissemination of the bacterium. Multi drug resistant TB (MDR-TB) has become increasingly common over recent years, affecting up to 3% of new cases and 17% of recurring cases. These cases are particularly difficult to manage, owing to the expense of the newer antituberculous agents.

At a more general level, in this regard, is the recent victory of the Indian generic drug producers against the large global pharmaceutical companies that sought to prevent their production and sale of medications still under patent protection. This has been extremely helpful for the delivery of cost effective care to the millions of poor Indians, and especially those infected with HIV, mycobacterial disease, and other chronic conditions.

While the scourge of the African subcontinent by HIV infection is well known to most people, what is less well appreciated is the huge number of the adults in India living with HIV. This is estimated to be around 0.31% and equating to approximately 4 million people, although this figure is likely to be an underestimation. Interestingly, a significant proportion of patients with disseminated TB and leprosy are also HIV positive- it is estimated that roughly 50% of HIV positive patients in India are co-infected with TB. Of this population,

some 200,000 people are thought to develop HIV-associated active TB every year. Commonly, patients are diagnosed with HIV or TB after a period of weight loss or non-specific illness.
In the UK, HIV testing is mandatory (with an 'opt-out' policy) in pregnant women presenting for antenatal care. It has also become routine in genitourinary clinics. This has led to a many people diagnosed with HIV as an 'incidental finding'. In India, patients usually have to pay for a test. Although the fee can be minimal, people are often reluctant to put themselves forward for testing due to the implications of being HIV-positive. The fear is generally for their families, their work and also with the negative way that HIV is considered in the population.

Reflection of my activities in the HLA Molecular Laboratory;

During my five weeks at the All India Institute of Medical Sciences, I spent most of my time in the HLA DNA Laboratory and received excellent support and encouragement. I tried to involve myself as much as possible in the laboratory's on-going routine and research work. This has allowed me to gain experience in designing polymerase chain reaction (PCR) experiments from first principles. I also performed extensive literature searches, investigating the influence of several immune genes on the predisposition and progression of HIV infection amongst Indians.
Among several lines of work, I was particularly involved in a project looking at the frequencies of a 3 base pair (bp) and 18 bp deletion in the gene encoding for TIM-1 (T-Cell Immunoglobulin and Mucin 1) protein in healthy Indians compared to those with Coeliac Disease. The hypothesis was that the T-cell disturbance relating to the specific polymorphisms in the TIM-1 protein was associated with disease outcome in Coeliac Disease. Because the project was at a very early stage, my main aim and role in the laboratory was to design the PCR experiment, standardise our protocol, and map out the frequency of these genes and deletions in the North Indian population.