

The 1,351st Meeting of the Brighton and Sussex Medico-Chirurgical Society took place on 1st December 2016 in the Audrey Emerton Building:

The president elect Mr Charles Zammit introduced Professor Karen Walker-Bone Director Arthritis Research UK/MRC Centre for Musculoskeletal Health and Work which is affiliated with the University of Southampton.

Prof. Walker-Bone introduced the Locomotor System as a design of mechanical excellence and highlighted the basic anatomical features of a typical joint.

Her talk focused on three main topics covering aspects of Rheumatology, Osteoporosis and Effects of musculoskeletal disease on health and work.

'What is Rheumatology?' The word rheumatology has its origin in the word "rheuma," which means flowing (Hippocrates). Rheumatology is study of rheumatism, arthritis, and other disorders of the bones, joints, muscles, and ligaments. The history of 'rheumatology' was highlighted with Egyptians first describing hot, red painful damaged joints in 2640 BC. Examination of 400 Saxon, Romano- British and mediaeval skeletons from seven archaeological excavations in the west of England showed changes suggestive of osteoarthritis. Changes suggestive of ankylosing spondylitis were found in the 3000-year-old Egyptian mummy of Rames II. Osteoporosis was also seen in ancient skeletons. Hippocrates (460-370BC) made several observations about gout, calling it the "unwalkable disease". He also noted that eunuchs do not take gout, nor become bald. Interestingly he also observed that women do 'not take gout unless her menses is stopped', and that a young man does not take gout unless he indulges in coitus. He called it "arthritis of the rich."

The exact cause of Rheumatoid arthritis (RA) is not known, though there are clusters of it in families, hence there is an inherited predisposition but often skips a generation. Studies suggest that genetic make-up contributes approximately 30% of all cases. Environmental factors contribute to 70% of the causation but no evidence to support e.g. diet, climate or allergy as causative. The symptoms of RA are variable with a gradual or acute onset. Hands, wrists, feet often affected early. It may affect only one joint but it is usually symmetrical. Typical effects are malaise, fatigue, stiffness of the joints in the early mornings of variable severity and duration. Recurrent 'flares' of pain, swelling and tenderness of joints is common. It tends to affect most joints except the spine. Classic examples particularly of hand and feet deformity were shown.

The pathogenesis of RA is that of an auto-immune disorder with the immune system that usually is protective against 'foreign' invasion somehow it gets programmed not to recognise 'self'. When the tolerance of 'self' is lost – the immune system starts to 'recognise' self as foreign and create auto-antibodies. Cytokines play a role here, they are soluble extracellular glycoproteins. They function as local messenger and signaling molecules which regulate innate and adaptive immune responses, inflammation, cell growth and differentiation, apoptosis, angiogenesis and tissue injury and repair. They may be pro- or anti-inflammatory. They are integrated into 'networks' where they promote or suppress the actions of cells with complementary receptors. Their complex

immune balance(homeostasis) is what keeps us healthy. One of these cytokines is called tumour necrosis factor (TNF). It is a dominant pro-inflammatory mediator. Mouse studies demonstrated that anti-TNF α ameliorated the clinical picture and prevented joint damage and this led to clinical trials in patients. Inhibitors of TNF resulted in a 50-70% improvement in tender joint count, a 50-70% improvement in swollen joint count with consequent improved quality of life and reduction in levels of disability as it arrests joint damage (both erosions & joint space narrowing). This is costly with a £10,000/patient/year but with more drugs on the market this is coming down even though one could not put a price against patient quality of life.

What is Osteoporosis? This is the loss of bone mineral density diagnosed with a simple bone scan. The burden of osteoporosis is very large with a prevalence of osteoporosis is 35% among women and 19% among men. There are approximately 536,000 incident fragility fractures in 2010 in UK and 79,000 hip fractures. It is responsible for 6,059 deaths. The cost of acute and long-term care as well as therapy and assessment is around £4.4 billion totaling to £11.5 billion when another factors are included. The projected costing for 2025 is in the region of £14 billion. Current treatments include bisphosphonates with variable delivery systems and costing. They do come with side-effects, the commonest being upper GI irritation, oesophageal cancer, musculoskeletal pain and osteonecrosis of the jaw. Again cytokine treatment development is the future treatment in halting and treating the disease process. Recombinant Parathyroid hormone (rhPTH-1-34) is a very promising drug particularly in steroid induced osteoporosis.

Musculoskeletal health and work rheumatology related issues. Mental health and musculoskeletal health account for the two commonest work disability related concerns. Recruitment to occupational health research in the UK is challenging with a significant need for strengthening and developing academic capacity in this area. There are currently no clinical lecturers in Occupational Medicine nationally. In view of this background the foundation of the Arthritis Research UK/MRC Centre for Musculoskeletal Health and Work in Southampton as an internationally recognized centre of excellence would provide national leadership in research and translation in rheumatology, addressing important and tractable questions, bringing together multiple disciplines and centres in constructive collaboration to deliver enhanced outputs. It would also capitalize on strengths to augment funders' investment with complementary funding from external sources as well as training a new generation of researchers. Professor Walker Bone ended her talk by acknowledging the rest of her team and multiple collaborative centres throughout the UK.