Skin biology video 5 itch notes

Trying to measure severity of disease impact on patients is hard (but a growth industry). Many skin diseases affect the appearance, and often this is underplayed as 'cosmetic' or 'aesthetic'. You do not need to be a budding supermodel to understand what effect diseases like psoriasis have on esteem, and social and sexual interaction. Stigma remains rife. On the other hand, itch literally drives some patients 'mad'. Not all itchy conditions have a rash: you can itch +++, but have little to see apart from the damage you induce with scratching.

The purpose of scratching may be a surprise. But note how in many reality TV shows, cutaneous infestations or infections, cause the most problems.

Scabies. We will deal with this later in edderm101. It is caused by a small mite (0.5mm) (*sarcoptes scabiei*) and was the first agent of any infectious disease identified, in the early 1700's. It is spread by ***close contact***: usually sexual in adults, or in the case of children, from the close contact that may occur during play.

Evidence of the value of scratching comes from people with **neurological deficits**. If you have a hemiparesis you will have more scabetic burrows on the 'good' side.

The picture of the boy wearing gloves. This was a not a fashion statement. Usually in atopic dermatitis in children the harm done by scratching is so great, that we often use gloves at night to minimise the harm done by fingernails (which need to be kept short and manicured, too).

Multidimensional. Itch is said to be a multidimensional modality, a bit like pain. There are different sorts of pain, and not all itch is subjectively described in the same way. Similarly, the scratch response often differs between diseases: in scabies you see lots of scratch marks, whereas in urticaria there is less damage from scratching — even though in both conditions patients judge the severity of itch as severe.

Location of itch fibres. For over a century there has been debate about whether there are nerves in the epidermis. The old German literature said they were then, but others could not repeat their work. Modern techniques show abundant nerves in the epidermis. The Germans were right all along with their silver stains.

Site of application of histamine. In the video I said histamine was applied to abraded skin. One way to do this is to apply sellotape repeatedly to an area of skin. The issue is that if you inject histamine deeper in skin, you get pain rather than itch. So the location of a stimulus is important. Another good way of introducing histamine superficially for itch studies is with a small electric current (iontophoresis).

Number of pathways. I have played it as 1)histamine and 2) non-histamine, using the example of the PAR pathway. My guess is that there are many more pathways / mediators.

Histamine. Although most of the physiology of itch has used histamine experimentally, the itch of few diseases is due to histamine. In urticaria H1 blockage improves many if not most patients. The itch of eczema, lichen planus, liver disease etc is NOT histamine mediated.
Proteases and PAR. As the video on barrier functions mentions, proteases play a big role in the remodelling of the stratum corneum in desquamation.

Alloknesis. Note that itch can be perceived even though it has not travelled down peripheral itch fibres. Analogous to what happens in pain.

Itch is 'infectious'. Usually refers not to scabies, but the fact that higher cortical factors have a top down effect on perception at the level of the cord and periphery. Many students who see videos of scabies or patients with lice, tend to start scratching themselves. There is some sensible biology behind this.