

Allostatic Load and Medical Illness 4

Written Video Transcript

= possible mediators and I think—and this really how can you assess? Is there some way that we can detect at an early phase those folks who are carrying greater allostatic load than others? And the answer is, yes, there [00:00.20.00] may be. And in one very important experiment that Bruce (McKeown) carried out and (Candice Seaman) carried out with older folks in the Northwest, in the Seattle, Washington area was they looked at different levels of biological function in terms of urinary cortisol [00:00.40.00] levels, (catocolomines). I think there's more on the next slide. I guess there isn't. But basic what they were able to identify were people who maybe had just small differences in blood pressure, a small difference in pulse rate, [00:01.00.00] a small difference in cortisol, not pathological. But those people who seemed to carrying the greatest allostatic load three years later were the ones most likely to have medical problems. So we—there's beginning to be a technology so that we can begin to identify those folks. And I think we need to that in PTSD. Some of the consequences, again, [00:01.20.00] in terms of health would be affecting the immune system, would be delayed wound healing, glucose function, etc. But some of the things that you can look at in terms of allostatic, low waist/hip ratio, hemoglobin levels, cholesterol, fat deposition as well as blood pressure and other problems. [00:01.40.00] Okay, now I'm going to quickly go through the different kinds of allostatic load and make the point of how these might play out in PTSD. So, to refresh your memories, type one allostatic load is repeated hits. [00:02.00.00] The system responds and recovers in a normal fashion but it has to this a lot, repeated hits. Well, there is a fair amount of research now on what repeated hits do. Repeated surges of [00:02.20.00] blood pressure can actually increase the risk of developing arteriosclerosis by shearing the walls of arteries therefore leading to deposition of blood clots and all the stuff that follows that. So that [00:02.40.00] repeated hits alone, even with normal recovery, may confer a vulnerability to arteriosclerosis, to myocardial infarction. Repeated hits may also, in terms of the hyperreactivity of both the HPA, the adrenergic—that's the locus (cirrulus), noreprinephrine, as well as the immunological system [00:03.00.00] may also produce important kinds of consequences. So, those are the kinds of things if you're thinking in terms of an allostatic model that you might want to check out, given the theoretical conceptual clinical approach that I'm suggesting here. Now, here's type two. [00:03.20.00] Remember type two allostatic load is a failure of adaptation where this a normal response exposed to the same kinds of a stressor, the capacity of the body in one way or another to kind of tune out the distractions [00:03.40.00] or the stressful situations, to adapt to these kinds of things so that the large response in the beginning becomes attenuated. And people with PTSD can't do this. They can't do this. And there's a very rich amount of data particularly on the PTSD startle response, people with PTSD. [00:04.00.00] And that's a good example where people in terms of a startle response, exposing people to a startle stimulus such as a loud noise, you keep repeating



this noise, after a while you're not going to startle at all a normal person. PTSD people can't stop. Failure of habituation. [00:04.20.00] Well, so what? What kind of a consequence might that mean. Well, I think that we've talked about hypertension, that's the obvious one. I think one that is perhaps less obvious but perhaps more important is sensitization, sensitization of neurons. Sensitization of neurons in the systems of the brain [00:04.40.00] that process emotional information or process cognitive information. One of the hallmarks of the person with PTSD is that he or she is always on ready alert, always hypervigilant, always looking out for the next adverse stimulus. The person with PTSD [00:05.00.00] has a detection system that is biased towards false positives because a false positive can't hurt you, a false negative can. And we know that these people with PTSD are hypervigilant, are hypersensitized. And there is some data [00:05.20.00] looking at brain tissue, particularly in the hippocampus, suggesting that indeed the person with PTSD may have a hypersensitized system in certain important crucial areas of the brain that are maladaptive and maybe very difficult to correct that can't habituate. [00:05.40.00] Okay, type three allostasis is a prolonged response. There's no recovery. Recovery would happen about here. So, once people are aroused they can't get down. And we know clinically that that's what we see in a lot of our patients with PTSD. [00:06.00.00] We can't count—we can't talk them down, we can't tell them to be rational about it because what's happening inside of their brains, inside of their biological systems isn't reachable by rational discourse. No recovery. So, what might that—how might that play? [00:06.20.00] Well, I think perhaps the most important example of a lack of recovery that we've—so far in terms of PTSD research is the elevated CRF. Normally, when CRF is doing its job, there's a stressful situation, CRF is produced, it activates [00:06.40.00] ACTH, it activates cortisol. And then it shuts down, it goes back to where it came from and the system normalizes. Folks with PTSD don't normalize. The system is in a high state of arousal. And in addition to these consequences from the earlier diagrams what that means is other key systems [00:07.00.00] that are suppressed by the HPA system are going to remain suppressed, whether it's some of the thyroid system, the growth system, growth, the gonadal system in terms of reproduction or sexual functioning and also metabolic syndrome X, which I am predicting would be something that we would see in PTSD [00:07.20.00] if we would look in the right place. And finally is allostatic load type four which is just the opposite, that the system is depleted. The system has lost its capacity to respond. This is also maladaptive. It's really interesting when you start looking at the allostatic model and how many different ways [00:07.40.00] can one be maladaptive psychobiologically. And I think these four probably don't cover every contingency but they cover many of them. So, what are the consequences of in—well, one possibility would be the low cortisol levels. And with low cortisol levels you're going to have release of the immunological system [00:08.00.00] and other kinds of mechanisms that will be particularly important medically in episodic medical problems. Problems that flare up when confronted by stress, such as chronic fatigue syndrome, fibromyalgia, pain syndromes, rheumatoid arthritis, asthma, irritable bowel syndrome, etc. Okay? [00:08.20.00] So, to just refresh your memory so I can move into my next component of this talk, to bring this on home. So, allostasis as defined by McKeown and (Steller) is an organism's ability to achieve stability through change. [00:08.40.00] And our organism which has evolved through evolution has an



amazing multi-varied way of adapting. There are many different ways by which we can adapt. But you pay a price. You pay a price and the price [00:09.00.00] is what McKeown has called allostatic load which is the cumulative wear and tear on a system to maintain vital functions. And what I've been trying to show is how this general hypothesis—because this isn't just about PTSD—but how this general hypothesis really does help us understand the PTSD data [00:09.20.00] as I understand them in terms of vulnerability to medical illness.

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