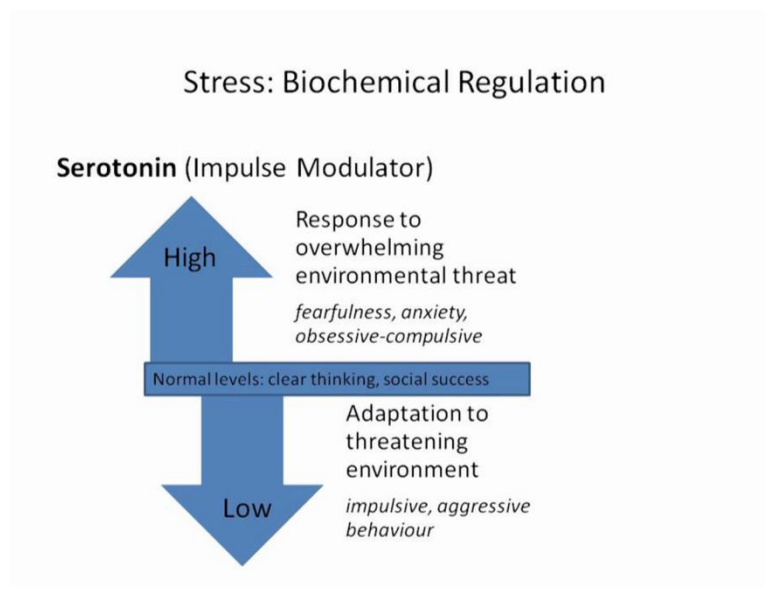


Human Adjustment Processes
Prof. Braj Bhushan
Department of Humanities and Social Sciences
Indian Institute of Technology, Kanpur

Module - 7
Lecture - 2
Facets of human adjustments: Stress, Resilience and Coping

(Refer Slide Time: 00:14)



Last time we were talking about the physical symptoms.

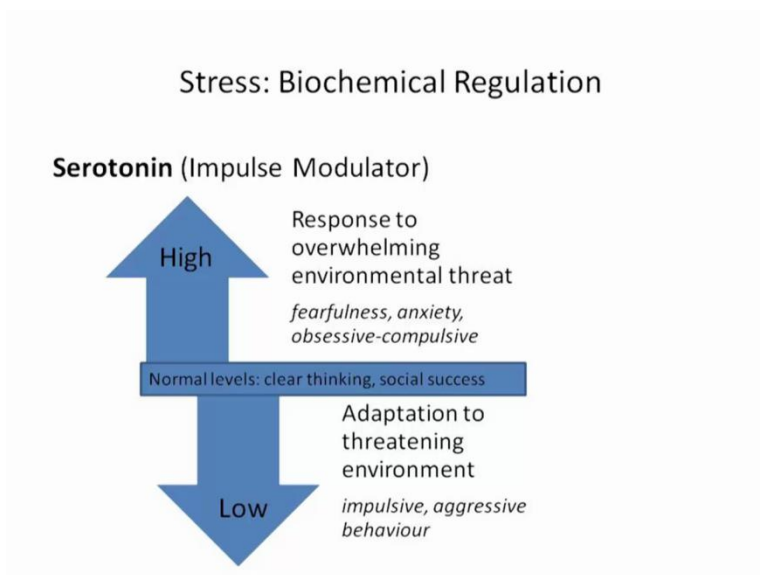
(Refer Slide Time: 00:20)

Symptoms of Stress

Physical symptoms	Manifested behaviour	Psychological reactions
Muscle tension	Decreased concentration	Increased anger
Change in eating habits (loss of appetite or overeating)	Decreased sleep duration or sleep disturbance	Increased anxiety, fear, confusion, and worry
Bowel upset	Decreased memory	Tearfulness
Headaches	Increased clumsiness	Frequent emotional outbursts
Backaches	Increased use of cigarettes, alcohol, or drugs	Ruminative thoughts
Restlessness	Withdrawal from usual activities	Decreased self-confidence
Fatigue	Irritability	

The behavior that reflects the stressful state of an individual and then the psychological reactions. Now, when you make a mix of it means, when you say that in totality, if you want to see a how is stress is reflected by a human being whether it is in terms of the physical reactions of the body whether it is in terms of certain processes, which are know later on glaringly visible or whether it is in terms of certain forms of behavioral changes. One important factor that we realize looking at the whole set of symptoms is that there is a sound biochemical regulation process. So, by default, if you say that the muscle becomes tensed, if you say that no stomach clenches, if you say that one had certain degree of forgetfulness or one has certain inability to concentrate all of them would be guided by some type of biochemical change that takes place during the state of stress.

(Refer Slide Time: 01:37)



So, today what we would do? We would a primarily talk about the biochemical regulation and our attempt would be to focus on three different chemicals available in the brain. One serotonin, two noradrenalin and third would be cortisol. There after we will also know look at the prominent brain structure and how the stressful state knows is achieved and how it influences our psychological output. And then we would move to a two important call syndromes, which are know talked about very waymently in the area of stress.

One the model given by the Hans selye, you remember Hans selye we are discussed right in the beginning when we were trying to define stresses and stress. So, he gave a model

called general adaptation syndrome, which once again has a combination of the physiological mechanism of the body and the psychological output. And then we would be talking about the second important know syndrome, what is called as? The burnout syndrome. Now, serotonin is also considered to be impulse modulator means neuron transmitter in the brain which has the capacity to modulate the impulses of an individual. Now, what could be the possibilities, first possibility that you have a normal level of serotonin in the brain, second either you go in a hyper state. So, there is extra secretion of serotonin or there is a hypo secretion that is there is a low amount of secretion of serotonin.

Now, if you have a balance level or the normal level of serotonin, then you performs your functions know as per the requirement of others the environment and your own self. So, in terms of psychological processes your thought processes are very clear, you can understand things, you can extract a stimuli from the environment, you can think about it very clearly and then you can execute the task and because, you can think rationally. Because you can execute the task therefore, it promises certain degree of social success, because you are been able to decipher the environment you have also been able to give the desired response the proportionate response problem comes when you have either a hypo or a hyper secretion of certainty, what happens if there is a hyper secretion extra amount of serotonin secretion in the brain response to over whelming environmental treats.

Whereas, if there is a hypo secretion it leads to the adaptation to threatening environments and how these things get reflected in the hyper state you show extreme degree of fearfulness, you develop extreme degree of exiety. There are also obsessive compulsive behavior; you understand all three of them? Are you need little elaboration? Clear, ok. Then I will begin with the first one then know, see fearfulness you understand know that you are extremely sacred of certain thing and when we say that it is no extreme fearfulness this means that the environment actually does not want to you to react that way, but somehow know your response is disproportionate in that sense know.

So, if you have to be a scared in the given situation the level of scary behavior that you reflect basically in the state of a hyper secretion of serotonin is a disproportionate response, same is the case with the anxiety in obsession compulsion basically it know consists of two parts, obsessive behavior is one part and compulsive behavior is the other

part. And they are primarily to different, but associated operations in the brain, obsession reflects a state when you have a single thought that perseverates in your mind and usually these are ruminative thoughts. So, thought and then know you keep on keep on keep on you know thinking about it, that is an obsession. Compulsion when it translates into action so compulsion would be, compulsion would be the repeated acts, but again these are unjustified acts, the way there was no point that you keep on keep on thinking about the same thing for a longer time, similarly in compulsion there is no need for you to repeat the same set of behavior.

Now, a obsession would know you have one idea or a narre of ideas, tow, three, four and know throughout the day you are lost, but understand that this is different from what you consider as immersive learning you must have heard this is word know. Now, if you are put in a workshop, in where intense involvement is needed so say one day two day three day workshop where different types of activities are planned. There is final aim that has to be attained, but those or the person who has know designed the whole workshop knows what actually has to be achieved. You keep on only participating in the process and at the end of it, it makes you realize oh good, now I feel better, now I feel why I was doing that.

In such type of workshop sessions they are primarily designed to a give you an experience of immersive learning where you are submersed in the thought and that thought sustains within you for a longer time and finally, you gain something out of it. That is different, here there is no such situation simply know a thought comes to you or there are two three associated thoughts and it repeats in a cyclic order that is obsession. And compulsion is repetition of activities a very common examples would be say, you locked the door of your room in the hostel and majority of us are a know usually what you call drag to the idea that once you lock it, you should at least pull it once to check whether it is locked properly or not to that extent it is fine, know that you have locked it you are not very sure about either your action or the quality of the and hence you pull it once that is fine. The problem comes when you start repeating it. So, lock one two three and then you say locked turn back few steps did I lock it again you turn back and you find it is locked again you go and pull it twice these are compulsive acts.

There are a many more forms of compulsions, but because it is so nicely ingrained in our behavior that we hardly realize this is a compulsive act. Say you are walking from this

lecturer complex to you hall of residence you find the small piece of stone lying in the cycle stand and you hit it once, because of its irregular shape the stone moves on the road, but keeps on changing the trajectory of movement. So, it know, you hit in this direction, but it goes slightly on the right hand side and you decide to change your path to again go and hit the stone and finally, the stone reaches along with you to your hall of residence. There was no need for you to chase a small piece of stone and make it also reach your hall of residence, but you do that ok.

You are know, over whelmed about cleanliness and your whole idea that germs could there know, if I touch places, which are utilized by others also and hence I should be much more careful about know the bacterial infections. And therefore, you wash your hand, all of us wash our hand after certain acts, you go to the toilet come back and wash your hand, before having a meal you go and wash your hand, but if you keep on washing it ten times, you will find the worst cases of OCN it is called obsessive compulsive neuroses or OCD obsessive compulsive disorder.

The worst sufferers you would find that they even start losing the surface of the skin, but they do not stop washing their hands multiple times. You are always know dragged by or fascinated by the idea that the room repeatedly will have dust thin full of dust here and there. So, twelve o clock in the night you suddenly wake up and start cleaning your room again three o clock wake up start cleaning your room and you say you know I am very very know fond of keeping my place cleaned, these are the acts of compulsions. Why these are two things are plugged together, because an obsessive thought will certainly leads to a compulsive act. Therefore, obsession and compulsion are always plugged together and we call it OCN or OCD.

But if you have a hypo secretion of serotonin that is the lower amount of serotonin in the brain then you show certain degree of adaptation to the threatened you perceive in the environment and hence you become too impulsive, you become too aggressive. Now, if there is a need in the environment for you to be impulsive it can be understood, if there is a need in the environment for you to be aggressive it is understood, but if there is not a need for you to be impulsive or aggressive still you become. Take two examples; you are sitting here, certainly there is a message in your mobile phone, call me and say this is a message from your friend and you just read it and you keep it once I am out at a given time, when this lecture would be over I will go out and then make the call to him, say

that yeah I was in the class, therefore, I could not call you immediately. This is what large majority of us could do, but if you are somebody who thinks that there can be messages from others who would like to me to call oh there is no message no message then you find a message and you say I should definitely call you do not know think of the fact that there is no need for you to show certain form of behavior.

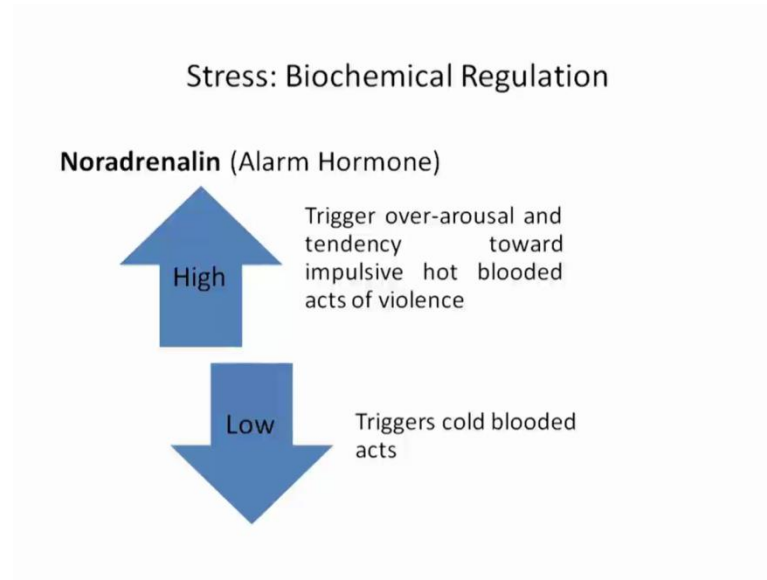
Take one example, you have checked your mail you do not have any new mail in your inbox, but every few minutes you refresh it, if the whole world is now trying to send the message to you this might not be true. In fact, this is never true, very few people would be interested sending mails to you and few mass mails would reach you. You have read the message and now, there is no need for you to impulsively keep on keep on refreshing your inbox, but many people do so. And a large time of their large know time that they could have otherwise used in productive activities goes only in a refreshing base ok.

Take another example, this is the example of aggressive behavior; say you saw an accident taking place somewhere, you are coming to a lecture hall complex and you saw an accident taking place in the road. And then you decide that I should certainly know help this person reach the nearest health center. And you find know that that traffic is very crowd take people are not allowing you to know take this patient to the hospital and you think that, there is no urgent need for this patient to be immediately know, send to a doctor and therefore, you show certain degree of aggression.

You shout at people you scream know you show certain aggressive act and you say that no you give way to me, because I am carrying a patient who had met an accident and I have to make him reach a doctor within certain time span. These are aggressive acts, which are justified, but imagine a situation you come little late to the class, you have to make an entry in the row and you suddenly start shouting others, why are you sitting here? If you have come early you should sit on this side. So, that I get a proper chair on the other end to come early occupy the chair on this side and then instructor had told me not to cross know from the front and therefore, I have to cross the whole row it is so difficult. Such type of aggressive retaliations is not necessary, it is not justified, but what happens in the state of hypo secretion of serotonin, this is a more likely to happen, this is bound to happen that although there is no need for you to be impulsive and aggressive

you do become that. Therefore, know imbalances of serotonin will certainly affect the stressful reactions shown by the individual.

(Refer Slide Time: 17:59)



Similarly, we come to noradrenalin; again in the case of noradrenalin we take both the states the hyper and the hypo states. Noradrenalin is also called as alarm hormone. So, it alarms you, little later we will talk about the general adaptation syndrome and once again we will refer to noradrenalin there. Now, if you have a hyper secretion of noradrenalin it triggers over arousal and a tendency towards impulsive hot blooded acts of violence. And the reverse happens when you have a hypo secretion the lower level of a noradrenalin where you have a very cold blooded act. And if you think from psychological view point social view point legal view point neither hot blooded acts nor cold blooded acts are acceptable.

And therefore, once you have no extra amount of realize of noradrenalin in the brain, which leads know disproportionate amount of know arousal within the individual, you are aroused out of nothing and it leads you to appoint, where you commit an act of violence, which is extremely hot blooded act. So, you just know consider that oh why were you staring at me although you were sitting in the corner I come and know stab you one twice ten twenty times you must have heard many such situations know. Unfortunately in most of the cases we do not have know the actual endochronological report of what has what was the mental state of the individual and what type of a neuro

chronological state the person was in a, but if you look at different acts of violence earlier something that we usually think to be visible only in the west. Now, you have such things happenings in India also, we will take one or two newspaper clips when we come to our next module where we would be talking about the aggression. School shootout was not news in India ever and most of the school shootout cases we heard about was in the US. For the first time some I think few months back was a news of school shootout in Punjab and that was the first time to the best of my knowledge in India, where you have a reported know school shootout episodes.

Interesting episodes, a student shoots a teacher in Bangalore; a student stabs a teacher in Madurai. There are know many, many such type of news, which comes to the falls from now a days. Now, we do not know, somehow our system is not tuned that way know that once you catch hold of the culprit have thorough profiling done including what was the andochronological state of the individual that would tell you know what was the level of noradrenalin, but at one end you have many such acts, which are disproportionate acts, if you have not done your homework and if your teacher scolds you the teacher does not deserve to be stabbed in the class.

Imagine that situation know you do not complete your homework, the teacher scolds you and then you immediately you come and stab the teacher, this is extreme of the hot blooded act of violence that one can think of the cold blooded act of violence, I do not know if you remember this news know, I think it is more than one year old news from Uttarkand, where a software engineer had, who had recently know come back from abroad, because he was expelled from the job there, due to all this crunches, comes here know had some tough time with the wife, kills her, cuts her into pieces goes and buys deep freezer puts all the body parts know, the slices in the deep freezer. And then everyday he would take one piece out put it in a bag and then go out as he is going somewhere or going to walk with the bag and he would by the time he would come back home he would throw the bags somewhere at some deserted place.

Now, imagine such acts of violence know, where you kill somebody and then you know, just like cheese you cut the human body in to pieces then you plan the whole thing then you go and buy a deep freezer you buy multiple bags, because you count the body pieces accordingly you buy that many number of bags these are wired type of things that one

can think of know, but these reflects the cold blooded state of mind of an individual. So, hypo secretion of noradrenalin leads towards cold blooded acts.

(Refer Slide Time: 24:01)

Stress: Biochemical Regulation

Cortisol

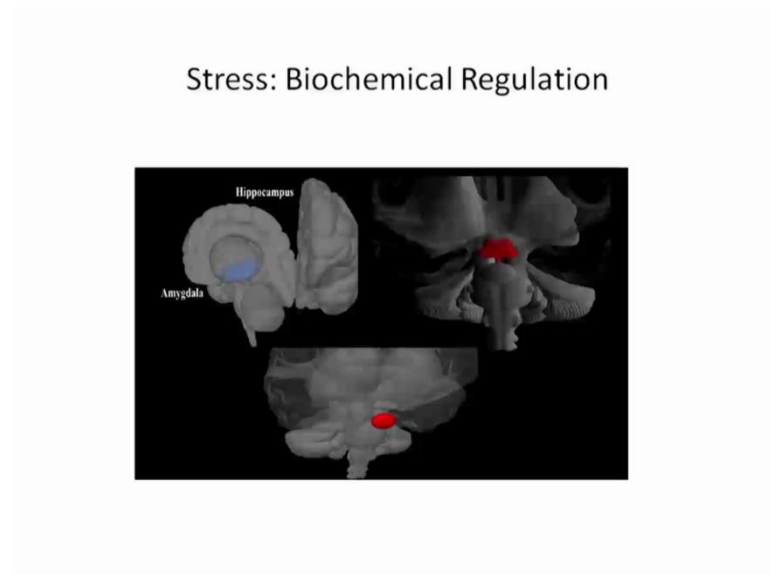
- Kills brain cells
- Reduces number of cell connections
- Shrinks Hippocampus
- Impairs thinking & selective attention
- Creates anxious behaviour

The third important chemical in the brain a we had refer to it in the, our previous lecture also. So, the third important chemical in the brain is cortisol. Now, cortisol once it is realized, it has this ability to make the neurons in the brain die. So, what it does is that it starts killing the brain cells, the neurons. And therefore, because it kills the neurons this would mean that the whole neural circuit that we have for different types of functions that be performed that will have less number of cells know, because increased amount of cortisol and few cells die. So, initially if you have sixteen billion cells it will starts decreasing.

So, every time you have extra amount of cortisol there you have a reduction in this. This also leads to shrinking of vital brain areas like hippocampus, just the next slide would be where we would be know, see a that how hippocampus, amygdale the limbic system, they play an important role in emotional regulation. So, what we call as your ability to know understand the situation and come forward with the very proportionate type of a response to come forward with a desired and designated level of a emotional involvement and reaction are mediated by this structures in the brain, but then cortisol makes the size of the hippocampus shrink. This means that you have a loss many more neurons you also have shrinking of certain vital brain areas and this means that you are

paying a much heavier price for being in the state of stress. And in terms of behavior you have impaired thinking you have know very selective attention that is shown by the individual and overall the individual shows extreme degree of anxiety ok.

(Refer Slide Time: 26:28)



Now, the animations that you see here know basically shows you, the amygdale hippocampus the limbic region of the brain here, which is basically the vital organs in our body, which are primarily responsible for regulating emotions. They have the pituitary here and the hypothalamus glands here and these are the important structures in the brain, where you have know some change in the chemical regulation the biochemical regulation and then you realize that the stress starts becoming unsurmountable.

(Refer Slide Time: 27:19)

Stress: Biochemical Regulation

- Amygdala → Hypothalamus → Corticotrophin-releasing hormone (CRH)
- CRH controls the activity of the pituitary-adrenocortical system
- It mediates behavioural and autonomous responses to anxiety and stress

Now, stimulation of amygdala, it stimulates the hypothalamus to realize what is called as CRH, known as corticotrophin releasing hormone. So, you have a hormone, which is realized by hypothalamus gland of the body of the brain and this is stimulated primarily by the stimulation of the amygdala. Now, CRH controls the activity of the pituitary adrenocortical system, you remember know we were looking at the biochemical regulation and there we had serotonin we had noradrenalin and cortisol. So, the adrenocortical system, it is influenced by CRH. And what it basically does that it mediates behavioral and autonomous response to anxiety and stress. So, basically stimulation of the amygdala internally stimulating the hypothalamus to realize c r h, c r h internally stimulating know the pituitary adrenocortical system to influence the state of stress and anxiety in you.

(Refer Slide Time: 28:33)

Stress: Biochemical Regulation

- Perception of a stressful → CRH from hypothalamus → Adrenocorticotrophic hormone (ACTH) from anterior pituitary
- ACTH → Adrenal cortex → Cortisol

Now, if you perceive stressful stimulus in your environment it activates your hypothalamus and therefore, CRH is realized in the brain. This in turn stimulates the anterior pituitary gland in the brain to realize ACTH, the adrenocorticotrophic hormone. And when ACTH reaches the adrenal cortex it makes the outer layer of the adrenal gland realize cortisol. So, and we had seen how cortisol influences it will make your hippocampus strained it will make your brain cells die, it will make you become only selectively aware of certain things, it will make you over anxious out of know nothing. So, the whole of behavior you have once again know if you, if I repeat it know amygdala CRH pituitary secretion, perception of threat in the external stimulus CRH, ACTH, ACTH leading to cortisol realize cortisol realize finally, know making you very selectively aware making you very anxious out of nothing. And finally, you pay a heavy price even in terms of physiological functions, because you have reduction in the number of the neural connection you also have the shrinking you might have the shrinking of the amygdala.

(Refer Slide Time: 30:03)

Stress: Biochemical Regulation

- Amygdala is involved in the regulation of emotion
- Dopaminergic inputs to the medial prefrontal cortex
- CRH stimulates the cortex
- Cortisol triggers negative feedback channel
 - inhibits hypothalamus, pituitary, and hippocampus activities

Now, amygdala as we have been discussing know that, it plays very significant role in terms regulating our emotions. So, it stimulates the dopamine inputs to the medial prefrontal cortex, this is the area, where CRH also stimulates the cortex and cortisol triggers the negative feedback channel. And therefore, what happens that, because it triggers the negative feedback channel it inhibits hypothalamus pituitary and the hippocampus activities. So, is basically like say you have restressed it and gradually know you come down to a resting state ok.

(Refer Slide time: 30:52)

Stress: Biochemical Regulation

- Suppression of the LHPA axis restores the baseline cortisol level
- This helps contain the stress response thus establishing homeostasis

So, chemically what happens? The suppression of the LHPA axis, this finally, helps you come to the baseline level of the cortisol, but then you have base line level it goes up it perform certain know, it leads you to show certain behavioral inabilities or it gets manifested in certain forms of behavior, it causes damage to your brain then finally, you reach the baseline level of the cortisol.

Now, once you reach your cortisol level reaches the baseline you have attained the level of homeostasis, you remember when we were referring to the biological defenses, psychological defenses and socio cultural defenses know, in biological defenses we had referred to homeostasis. So, interms of stress and anxiety reactions once cortisol secretion reaches the baseline level after this know LHPA axis restoration. This is a state where finally, you have retained the homeostasis, but then before you come to this state your behavior has already suffered your brain has already suffered, because finally, an extra amount of cortisol was realized there.

(Refer Slide Time: 32:14)

General Adaptation Syndrome (GAS)

Hans Selye

- Three stages of GAS—
 - alarm reaction
 - resistance or adaptation
 - exhaustion

The problem comes when you have know repeated such situations confronting you and then know one two or few such episodes coming discretely to ones life that is perfectly ok. There would be a stressful experiences is in life and therefore, that is not a cause of concern. A problem only comes when you have know either a sustained phase, where something continues for too long or there could be a state, where you have know the repeated type of situations leading to extra realize of cortisol in the brain.

We now come to Hans selyes model, you remember when we started this topic we did refer to him. And he was the person who first knows tried to advocate that when you have certain types of situations in your environment. Some of the situations that you experience can be interpreted by you as a stress up and they qualify to be stress simply because, you realize that the demand it possess in front of you is something that you have difficulty attaining that level. Or you realize that the resources that are available to you and the demand that is made by certain elements in the environment they do not match. And therefore, you start feeling that resources available to you starts getting depleted the very fear that know the resources available to me might get exhausted, because the situation is disproportionately demanding it, makes you interpret that the situation is extremely stressful. What Hans selye did was he was once again looking at the biochemical regulation and trying to associate it with the behavioral reflections know.

(Refer Slide Time: 34:36)

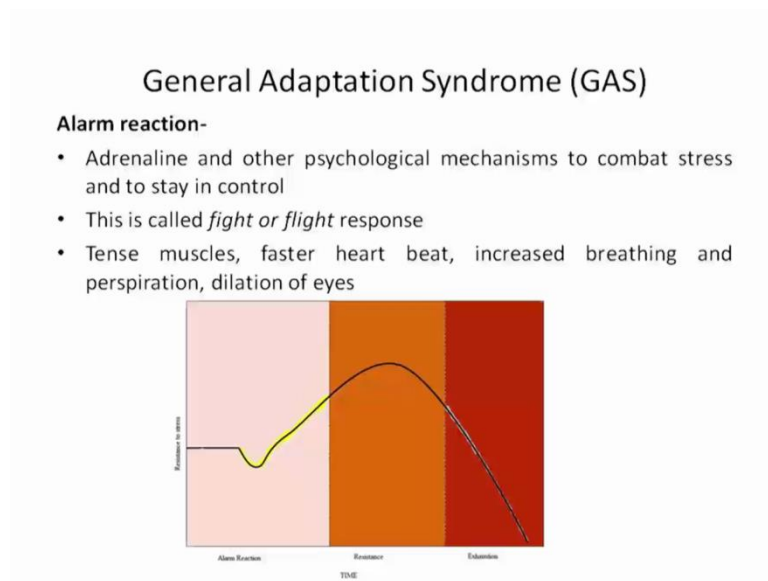
Physical symptoms	Manifested behaviour	Psychological reactions
Muscle tension	Decreased concentration	Increased anger
Change in eating habits (loss of appetite or overeating)	Decreased sleep duration or sleep disturbance	Increased anxiety, fear, confusion, and worry
Bowel upset	Decreased memory	Tearfulness
Headaches	Increased clumsiness	Frequent emotional outbursts
Backaches	Increased use of cigarettes, alcohol, or drugs	Ruminative thoughts
Restlessness	Withdrawal from usual activities	Decreased self-confidence
Fatigue	Irritability	

So, what I will do is that I will know go back to the slide that we had seen in earlier where we had the full set of symptoms know the physical system, where you have know tension in the muscle problem in the eating habit. So, either you over eat or you do not feel eating at all. So, once again know there is a problem in terms of maintaining that level or know something that you have been well trained for the toilet training I am talking about, you still find it very difficult to manage simply, because you have know disproportionate type of a bowl upset, repeatedly feeling a headaches, backaches the whole tendency of becoming restless. And in terms of other behavior, where you have difficulty in terms of concentrating on something, which would mean primarily that your attention keeps on fluctuating very repeatedly something that you do not want. You show complete degree of your inability to either sleep or you sleep and you have known all your sleeps are accompanied by frequent wake up sessions.

You start reporting about difficulty recollecting things back from your memory. You tend to commit more and more errors commit more and more accidents something, which was know not at all too demanding at all like say entering in to the row like moving un straight opening a door. Even on small, small stuff for which your activities have now become automated there also you show certain degree of clumsiness. And overall minor things upsets you like anything you become extremely irritated. Your irritation makes you know shout, makes you much louder and when you start shouting at others you suddenly have tears in your eyes. Now, what Hans selye did was that he

looked at these whole spectrums of behavior. And then he said that basically there is a situation, which alarms you, associated with the three biochemical regulations we talked about know the serotonin, noradrenalin and cortisol. So, you have an alarm reaction in you there is a tendency in you to adapt to a situation or to resist to it, means your whole idea is to have a control over the situation. And finally, one attains the stage when one is completely entrant. So, you are completely exhausted. So, this was a trifurcated stage is of the stage of stress what Hans selye described as the general adaptation syndrome or what is popularly called as GAS.

(Refer Slide Time: 38:04)



So, what happens? First look at the graph. Now, you are running at a baseline level the straight line that you see in the pinkish area, that is the baseline stage and then you have know a change and then you realize that your resistance to your stress starts increasing. So, first you have a decrease for a smaller period and then it starts going up and then from this area, where you have this know, whole of increase in the level of resistance that yellow highlighted channel there. And then finally, you go to the area of resistance when you your resistance keeps on keeps on keeps on increasing and you come to a state when you cannot handle it anymore. And then the downward slide begins and it reaches the dark orange zone that you see there where you finally, attain a level which goes far below your normal baseline level.

So, you are completely completely completely exhausted. So, we will know discuss all this three stages one by one. Normal baseline level basically is that the physiological functions of your body, the neuro chemical regulation the biochemical regulation of your body before you experience the stressful state. This is the state; this is the state, which shows the normal baseline level knows. So, see usually in our know recollect your day to day experience, it is not that know situation comes and immediately within fraction of seconds there is a big change in your reaction, you take certain time there is a lull period know, there is a small time that you take finally, because you have to synthesize all your experiences, you have to know contemplate the whole scenario to understand how stressful the situation is. We need time to do that and that is the time when know you are still maintaining the baseline level and then suddenly oh my god, the moment you have oh my god know this goes down, but then you say any way we have to do something. Your resistance starts increasing, you resist to the maximum possible extent using all your resources goes up to certain level and then you say yeah, it is enough, the downward slide begins and a time state is enough, that is the state of exhaustion.

So, what happens in the first state? The alarm reaction, the body realizes adrenalin we have seen that know the whole CRH, ACTH and the whole axis how it reaches the baseline level. So, the body realizes adrenalin and a variety of other psychological mechanisms to combat this stress and to retain the level of control that one wants to. So, you are under stressful situation and your brain starts realizing adrenalin extra amount of adrenalin is realized, something has to be done has to be done has to be done. So, adrenalin keeps on keeps on keeps on getting realized and that in turn makes you feel [fl] I have to do something.

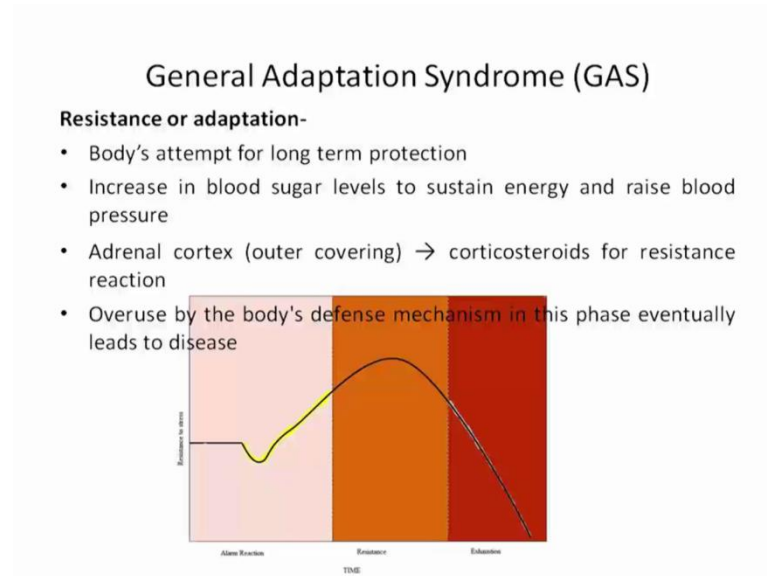
Now, this is in psychology we popularly call it the fight flight response, fight response is where you decide [fl] let me go I will go and do this the fight tendency, the flight [fl] you withdraw that is the fight flight situation. In fact, you will find great amount of literature available on fight flight responses shown by human beings the whole of psychology always has been talking about the fight flight reactions know. Bio sorry, the emotion regulation also you will find large amount of studies looking at emotion describing whole of emotional reaction with respect to fight flight yes, but these are still know the broad categories. I must tell you that we are not referring to it ,because it is not part of Hans selyes gas model, but if you are interested the new set of research, which is now

indicating that there is a new set of reaction that you see like the flight fight pair, what is called as tend befriend reaction. And tend befriend not I cannot endorse it, that this is what happens, because it still under researched, but tend befriend is the reaction, which is seen as if now, why the studies, which are conducted only in women ok.

So, even though you have to take revenge befriend the person know instead of fighting, because if you decide to fight say, if I consider you to be the source of frustration for me and if, I come to fight you, I might receive know all the negativities the consequences might be a detrimental for my own self for my own survival. So, instead of fighting is there a possibility of befriend you and then very quietly know taking the revenge that is the befriend reaction, but this is not part of the Hans selyes model, I just thought, I will tell you, if you are interested you can know read literature on this also. Not many research on tend befriend reaction, but a huge amount of literature you will find on fight flight responses. Now, you have extra amount of adrenalin secreted in your body and therefore, you decide your body response in terms of the fight flight mechanism. What gets reflected in your bodily functions? You have tensed muscles, you have rapid beat of your heart, your breathing increases, perspiration increases and the dilation of the eye also increases know. What I, there are beautiful research know ah I am deviating frequently, but allow me to do that there are beautiful researches in terms of examining the truthfulness of statements made by a politicians or those who are in part depending on the blink rates. And fantastic research on especially on the presidential candidates in the US, because they have these debates know. So, when you are asked questions when you give your opinion and there are beautiful research on by psychologist who have know analyzed those video tapes analyzed the blink rates on different topics and say how truthful and untruthful you are ok.

This is know, what is know, usually literature people call it reading between the lines. There is in fact, a beautiful paper on deceit behavior the untruthfulness, which says reading between the lies. So, you have a spoken ten minutes of line your speech and I am now, based on my research investigation, I am you have the one lie, the second lie and I am reading between the lies. So, this is just like metaphorically using the same thing you know, reading between the lies and this is again based on people redilation. So, alarm reaction will show this.

(Refer Slide Time: 46:48)



Then comes the second stage that is the stage of resistance or adaptation. Now, what happens the body starts making an attempt for long term protection. Now, further secretion of hormones that increases blood sugar level to sustain energy and raise the blood pressure. So, now, in the earlier stage where you had only the adrenalin now, you have other hormones also now being realized in the body in higher quantities, because you want to retain the blood sugar level as well as your blood pressure level these two things. So, the bodily homeostasis mechanism has to be maintained and therefore, extra amount of the hormones starts getting realized that is the second phases know. You remember just now we talked about the adrenal cortex know.

So, adrenal cortex produces hormones called corticosteroids right now, we had referred to it. For this resistance reaction, but what happens that over use by the bodies defense mechanism in this phase can finally, make you susceptible to certain types of diseases, because your bodily resources, which otherwise would have served you better in the long run it has been exhausted, because it has been over utilized in a very small period of time. It is something like a bank saving how much you withdraw using your ATM cards. So, if you withdraw say ten thousand every month this is still manageable thing, because say your father has put say one lakh in your account or one lakh twenty thousand in your account and every month know you are withdrawing ten thousand. So, you know that you still have resources available as and when there would be a need I will just go insert my ATM card and withdraw certain amount of money. But in a given situation you just

know go to the ATM machine withdraw forty thousand cash, the maximum possible limit per day transaction that is allowed, two days you unlefted with very minimal amount, three days forty thousand withdrawal the whole thing is exhausted ok.

So, resistance adaptation is that very stage know, where you have to maintain the level of blood sugar level, you have to maintain the blood pressure level, you have the amount of corticosteroid, because you want still to have control you have know still creating your resistance, but then because you are over exhausting yourself in this process. So, you are depleting your resources and then comes the stage of exhaustion, where the body basically runs out of its reserve for the energy as well as for immunity and that is the reason why you become susceptible to disease. Now, mental, physical and emotional resources they are over utilized in this phase and therefore, you suffer heavily for this and the body experiences, what is called as adrenal extortion, means your adrenal gland your adrenal secretion is no more in a position to support you.

So, remember a situation that you have achieved, where your biochemical regulation has been over exhausted and therefore, you consider that although, you did not need to reach that baseline level you need certain degree of a know neuro transmitters, but then you also realize that those bio chemicals are not available to you in the amount that is needed. The blood sugar level decreases, adrenal becomes depleted, there is a decrease in the stress tolerance level, but what finally, its seen in terms of a reflected behavior is that you have become extremely irritated the symptom that we had discussed minor things irritates you.

There is a progressive mental and physical extortion, most of the time you are physically exhausted, mentally exhausted with become susceptible to illness and there could be a possibility when you collapsed. So, as like say complete shutdown for certain period. So, that is all about the general adaptation syndrome which talks about being in a stage of a stress, where your resources are depleted biochemical regulations are over utilized leading you susceptible to both the physical as well as to the mental problems. When we will meet next, we will be talking about the second syndrome, what is called as the BOS or the burn out syndrome.