

# **FROM PREMATURE EJACULATION TO ERECTILE DYSFUNCTION VIA DEPRESSION**

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## **ABSTRACT**

### **BACKGROUND**

Master and Johnson have argued that premature ejaculation and erectile dysfunction are inter-related sexual dysfunctions. Premature ejaculation leads to erectile dysfunction due to the self imposed numbness to the erotic stimulation from the partner, in order to delay the ejaculation.

### **AIMS**

To explain the relationship between premature ejaculation and erectile dysfunction in terms of psychiatric illness; mediated by the functional imbalance of different neurotransmitters.

## **METHOD**

Several websites were searched for the words like depression, anxiety, premature ejaculation, erectile dysfunction, serotonin, noradrenaline and dopamine. It was followed by manual search for research papers, books and articles from sexology, psychiatry, and urology.

## **RESULTS**

Studies quoted prove that anxiety is closely related to premature ejaculation. Later on anxiety gets converted into depression, which in itself is an etiological factor of erectile dysfunction.

## **CONCLUSIONS**

It is concluded that premature ejaculation causes erectile dysfunction in the same way as anxiety leads to depression. Neurochemical changes in both the phenomenon are similar.

## **DECLARATION OF INTEREST**

None.

## **INTRODUCTION**

Premature ejaculation (PME) and depression are directly interrelated. Premature ejaculation can lead to erectile dysfunction (ED) and erectile dysfunction can cause premature ejaculation. Dual problem of PME and ED are the most daunting challenges in

the field of sexology. Determining the cause and effect relationship between the two is of great clinical importance for adequate treatment. Most of the time behavioral interpretation is given to explain the association between ED and PME. According to this model patient of premature ejaculation would try to delay orgasm through distraction method. They shift their attention from sex to nonsexual pursuits like business or would divert their focus by mental exercise e.g., reverse counting in order to postpone orgasm. At another time they produce counter sensations by nail biting, pulling of hairs, tightening of buttocks etc. As a matter of fact these methods were suggested by ancient sexologists. Master and Johnson have argued that such methods were counter productive. Sensations received from the female are the chief source of arousal. Methods of attention diversion deprive the person of erotic stimulus. Gradually over the time, the practice of curtailing sensory sexual input, results in development of erectile dysfunction<sup>1,15</sup>.

With the unprecedented advancement in psychiatry and psychopharmacology, alternative interpretations are now available. Most of the phenomenons are thus explained in the context of neurotransmitter imbalances. So this particular phenomenon can be described in terms of psychiatric disorders of anxiety, depression, and serotonergic, noradrenergic and dopaminergic dysfunction.

### **Study purpose**

Purpose of this overview is to analyze the association between premature ejaculation and erectile dysfunction and to study associated psychiatric disorders and neurotransmitter dysfunction.

## **METHOD**

Internet search was made using key words of anxiety, depression, somatoform disorders, premature ejaculation, erectile dysfunction, serotonin, noradrenaline and dopamine on various electronic database websites like Medline, Pubmed, emedicine and www.psychiatrist.com, followed by manual search of books, published papers and surveys on this topic in the field of sexology, psychiatry and urology.

## **RESULTS**

The results revealed few studies which showed that the basic mechanism of neurotransmitter action for premature ejaculation (PME) and erectile dysfunction (ED) are similar. It further suggested that anxiety and premature ejaculation are correlated. In addition, it substantiates that anxiety gets converted into depression, which in itself is one of the etiological factors of erectile dysfunction.

## **DISCUSSION**

### **Anxiety And Premature Ejaculation**

Orgasmic dysfunctions are the commonest presenting sexual problems. Among orgasmic disorders, premature ejaculation (PME) is the most frequently reported dysfunction. It amounts to 40% of total sexual dysfunctions <sup>2</sup>.

Cooper et al has described basic clinical picture and differences between primary and secondary premature ejaculation. Primary premature ejaculators (PPE) are those who had

been suffering since the beginning of their active sex life. Secondary premature ejaculators (SPE) develops after one year of satisfactory sexual activity. SPE have comorbid ED, reduced libido, and decreased arousal during sexual stimulation. PPE fared poorly on satisfaction scale as compared to SPE. Anxiety scores on Hamilton Anxiety Rating Scale (HARS) of PPE were higher than SPE indicating a closer association of anxiety and PPE <sup>3</sup>.

An anonymous postal questionnaire has depicted association of anxiety and premature ejaculation <sup>4</sup>. Premature ejaculation is the most frequent sexual problem in the male social phobic patient <sup>5</sup>. Clonazepam- a long acting high potency benzodiazepam has been proved effective in social anxiety but concomitantly high rate of anorgasmia has also been reported <sup>6</sup>. Thus, logically, ejaculatory latency and social anxiety are linked at some level. Comorbid premature ejaculation and panic disorder are treated with the same pharmacological agents like fluoxetine. Serotonin is involved in the pathophysiology of both PME and panic disorder. SSRI's have proven efficacy for both disorders. A 20mg dose of fluoxetine showed improvement in PME at week 2 of study. Variables of panic disorder and sexual satisfaction become statistically significant only as of week 4. The family of serotonergic receptors is concerned with panic as well as premature ejaculation. SSRI's regulate serotonergic and noradrenergic receptors simultaneously by their action <sup>7</sup>. Norepinephrine plays an important role in the induction of rapid ejaculation. Depressed patients with reduced libido but normal erection and orgasm did not responded to fluoxetine but there were no adverse side effects observed. When the same patients were switched to 4mg BD dose of reboxetine, their depression responded but developed

spontaneous ejaculation and premature ejaculation<sup>8</sup>. Seminal emission and ejaculation are under the control of anterior thalamic nuclei, preoptic nuclei, and median forebrain bundle on which dopamine has facilitatory effect.

There are reports of penile anesthesia with use of fluoxetine<sup>9,10</sup> but it is not specific to fluoxetine. Similar studies with use of other SSRI's like sertraline have been published. Common factor is increase of serotonin firing in central nervous system with the use of SSRI's. All the patients have reported concomitant reduction of all other sensations. But penile anesthesia is perceived more exclusively. In the rats modulation of nociceptive sensation and opioid analgesia is considered. Reduction of 5HT found in panic or depression possibly produces exactly opposite effects in the form of hypersensitivity in general and penile in specific.

Different serotonergic receptors have got different actions on ejaculation process. 5HT<sub>1A</sub> have facilitatory and 5HT<sub>2</sub> inhibitory effects. Norepinephrine controls spinal center of emission, ejaculation and closure of bladder neck during ejaculation. 5HT antagonists, 5HT<sub>1A</sub> agonists 8-OH-DAPT and adrenergic agents like ephedrine, pseudoephedrine and phenylephrine can reduce ejaculatory time. Subnormal growth hormone' response to clonidine has been observed in patients with panic, major depression and GAD which is an indication of reduced post synaptic adrenergic  $\alpha_2$  receptors functioning due to noradrenergic over activity<sup>11</sup>. Both HPA and locus coeruleus which are activated simultaneously in response to stress, facilitate encoding of negatively charged memories. This unbridled over- activity of locus coeruleus would result in chronic anxiety. In social

anxiety and panic disorder, level of norepinephrine is raised during orthostatic drop <sup>12</sup>. Association of these disorders with PME has already been discussed. It can therefore be deduced that PME and anxiety have common adrenergic and serotonergic basis.

### **Relationship Between Anxiety And Depression**

Robust association exists between anxiety and depression <sup>13</sup>. Anxiety is associated with depression in the range of 47 to 57% and 56% of anxious patients have comorbid depression <sup>14</sup>. Social anxiety disorder may precede major depressive disorder in 90% or more cases, with lag time of about 13 years. Depression is mostly of atypical nature. Possibly the two have common neurobiological features. Both respond to MAO's and need dopaminergic augmentation. Again, overlap between PTSD and depression are significant. Some authors consider complex somatic, cognitive, affective and behavioral effects of psychogenic trauma instead of treating them as separate phenomenon of anxiety and depression. 48% of PTSD subjects had life time major depression. Correlation between GAD and depression are very strong. Subjects with current GAD have 39% major depression or 22% has dysthymia. In GAD patients with lifetime psychiatric illness there was history of major depression in 62% or dysthymia 39%. Harvard Brown anxiety research project study has demonstrated that 54% GAD patients had major depression or dysthymia.

In an important study, subjects with PME were divided into two groups, E1 and E2. Former group had less neurotic features than later group. On psychological evaluation close resemblance was found between E2 and those who were having psychogenic ED.

Levels of depression in all groups under study except E1 was significantly high <sup>16</sup>. Level of anxiety among persons suffering from neuroticism is always very high. This particular study highlights interrelationship between neuroticism, anxiety, depression and erectile dysfunction.

Study by Symond suggests that premature ejaculation (PME) has similar effects on the person as erectile dysfunction (ED) <sup>17,19</sup>. Most prominent predictor risk factor of development of depressive disorder from anxiety is severe impairment of quality of life. Development of depression as a result of erectile dysfunction is a very common clinical observation. Quality of life gets disturbed in PME in the same manner as in ED. This particular study indicates that PME can lead to ED. Premature ejaculation gives a crushing blow to one's self esteem when one realizes that he is not capable to satisfy his sexual partner. His futile attempts of delaying the orgasm adds to his feeling of helplessness. This provides strong ground for depression to overwhelm. A number of base line anxiety disorders increase the risk of developing major depression. Depression and performance anxiety are closely linked. Anxiety begins in childhood or adolescence, while start of depressive disorder takes place later during young to middle adult hood <sup>15</sup>. Epidemiological studies lend strong support to prove the close relationship between depressive symptoms and erectile dysfunction <sup>24,28</sup>. These have a bidirectional relationship <sup>22</sup>. The bilateral relationship between ED and depression has been described in the study by Nicolosi et al .Relationship between ED, depression, sexual activity and sexual satisfaction was evaluated <sup>18</sup>. A population survey of men aged 40 to 70 years was conducted in different countries. Only those men were included who had sexual partners

and were not taking psychotropic drugs. 2% of them were clinically depressed and 21% had depressive symptoms. Prevalence of moderate or complete ED was 17.8%. Sexual satisfaction was found to be inversely related to depressive symptoms. It was suggested that interrelationship between depressive symptoms and ED is mediated by reduced frequency of intercourse and frustration generated by poor sex life.

Depression substantially affects sexual performance <sup>25</sup>. The Massachusetts Male Aging Study (MMAS) data indicates an odds ratio of 1.82. Other associated factors, both cognitive and behavioral, may contribute. A Zurich cohort study indicates that sexual dysfunctions are about twice as common in depressed patients as in general population <sup>27</sup>. So, it can be inferred that ED alone can induce depression <sup>20</sup>.

Yet, evidence has been provided by a neurological study in which activity of brain was monitored during sexual stimulation in depressed and healthy subjects. In subjects with depression, brain activation during erotic visual stimulation was considerably less than in healthy subjects especially in thalamus, caudate nucleus and inferior and superior temporal gyri. Both the groups- depressed and healthy showed no tangible differences in activation when they were exposed to neutral stimuli <sup>21</sup>.

Epidemiological studies reveal a vital role played by psychiatric factors in the genesis of erectile dysfunction. Psychiatric factors involved in ED are depressive disorders (18-35%), anxiety disorders (37%), OCD, psychotic disorders (46-47%) and antipsychotic medication <sup>23</sup>.

These studies and observations testify that a strong relationship exists among anxiety, PME, depression and ED. Frequent comorbidity of erectile dysfunction, PME and disorder of desire is of paramount importance <sup>26</sup>. In a typical case, initially there is a combination of anxiety and PME with occasional psychogenic erectile dysfunction, as seen in young adults <sup>13</sup>. Later on combination of depression and ED is more common. This is because anxiety is more common among young adults which is converted into depression with the advancement of age<sup>15</sup> and so is the PME which is more common among in young adults. This degenerates into ED with ageing. This psychiatric approach would help predict and treat depression induced ED more efficiently.

## **CONCLUSION**

In this paper it was argued that premature ejaculation is closely associated with different forms of anxiety. Different forms of anxiety degenerates into depression. Relationship of major depression and ED is very strong. From this syllogism an alternative explanation of development of ED from PME can be deduced.

## **LIMITATIONS**

We still cannot predict with certainty what kind of anxieties would be converted into depression. Secondly it is yet not possible to predict what type of depression would develop into ED. No classification of depression on the basis of neurotransmitter has been proposed.

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