# INTRODUCTION

Obsessive compulsive disorder (OCD) is a neuropsychiatric disorder affecting approximately 1–3% of the population. OCD is a chronic, distressing, anxiety disorder associated with significant functional impairment. Patient with OCD often suffer from one or more co-morbid disorders. Comorbid Axis I disorders along with increased severity of comorbid depressive and anxiety symptoms, increased severity of obsessions, feelings of hopelessness and past history of suicide attempts have been associated with worsening levels of suicidality in OCD ***(Angelakis and Gooding, 2015).***

OCD is represented by a diverse group of symptoms such as intrusive thought, rituals, preoccupation & compulsions. These recurrent obsessions or compulsions cause severe distress to the person ***(Sadock, 2007).***

Worldwide, it is one of the top 20 causes of illness related disability following depression, mood disorders, schizophrenia and dementia as regard psychiatric disorders according to WHO ***(Sadock, 2009).*** The prevalence of OCD is approximately 1-2%. It is considered the 4$^{th}$ most common mental disorder after phobia, substance abuse and major depression ***(Kestenbaum, 2014).***

OCD usually has disabling course and leads to a huge impact in different areas, such as sociability, family relationships, occupational and/or academic performance, and financial difficulties ***(Chaudhary et al., 2016).***

The symptom structure of OCD was best defined by four specific dimensions: (a) obsessions and checking (e.g., aggressive, sexual, religious, and somatic obsessions and checking compulsions) (b) symmetry and ordering (e.g., symmetry and exactness obsessions, repeating, counting, and arranging compulsions) (c) contamination and cleaning (e.g., contamination obsessions and cleaning/washing compulsions) and (d) hoarding. In patients with OCD, obsessions and checking were found to be more diffuse (92.78%) and associated with a greater overall functional and lifestyle impairment than other categories of symptoms ***(Dell'osso et al., 2012).***

Suicide is a multifaceted public health problem, yearly causing a world-wide premature loss of about one million lives, and generating a cascade of consequences affecting families, friends and societies that are often irrecoverable **(*Lee and Kim, 2011*)**. Regarded as the most dreaded of psychiatric disease outcomes, a diversity of risk factors for suicide have been recognized, of which depression stands prominent ***(Gibbs, 2016).***

OCD is associated with a high risk for suicidal behavior, It is vital that patients with OCD undergo detailed assessment for suicide risk and associated depression. Aggressive treatment of depression may be warranted to modify the risk for suicide. Future studies should examine suicidal behavior in a prospective design in larger samples to examine if severity of OCD and treatment nonresponse contribute to suicide risk ***(Kamath et al., 2009).***

Suicide behavior is not a highly common phenomenon in OCD, but it should not be disregarded, especially in unmarried patients, with comorbid depression and symmetry/ordering obsessions and compulsions, who appear to be at a greater risk for suicide acts **(*Alonso et al., 2010).***

Impulsivity also contributes to suicidality, and therefore might be an important construct for further investigation **(*Troisi, 2011).***

In Egypt, there is a high prevalence of obsessive traits and symptoms among the population especially the adolescents. A study was performed on a sample of Egyptian adolescents revealed that the prevalence of obsessive traits was 26.2% and that of obsessive compulsive symptoms was 43.1% among this sample ***(Okasha et al., 2001).***

Moreover, it is found that the severity of OC symptoms is one of the greatest predictors of poor quality of life of these patients ***(Demet et al., 2005).***

The chronicity, distress, high rates of comorbidity and varying degree of non-response to treatment in Obsessive Compulsive Disorder (OCD) may contribute to suicidal behavior. There is relatively little information on suicidal behavior in OCD subjects. Our study design is Single point non-invasive, cross sectional, clinical study of new and follow up cases ***(Dhyani et al., 2018).***

# AIM OF THE WORK

- Detect Frequency of suicidality among sample of Obsessive Compulsive Disorder patients.
- Evaluate several aspects affecting suicidality in Obsessive Compulsive Disorder in the recruited sample.

# Chapter (1)

# OVERVIEW ABOUT OBSESSIVE COMPULSIVE DISORDER

Obsessive-compulsive disorder (OCD) is a common psychiatric disorder that was first described by ***Esquirol in 183.*** It is a multidimensional and etiologically heterogeneous and is the fourth most common mental disorder after depressive disorder, phobia, and substance abuse ***(Myers et al., 1984).***

OCD is defined as a condition characterized by the presence of persistent intrusive, recurrent thoughts, impulses, or images (obsessions) and/or repetitive behaviors, rituals or mental acts (compulsions) that cause a significant distress or interference with daily functioning and impairment in quality of life and social and familial relationships ***(Altitas and Taskintuna, 2015).***

Many people have focused thoughts or repeated behaviors. But these do not disrupt daily life and may add structure or make tasks easier. Here, thoughts are persistent and unwanted behaviors are rigid and not doing them causes great distress. Many people with OCD know or suspect their obsessions are not true; others may think they could be true (known as poor insight) ***(Gorrindo and Parekh, 2017).***

## History of OCD:

From the **14th** to the **16th** century in Europe, it was believed that people who experienced blasphemous, sexual, or other obsessive thoughts were possessed by the Devil. Based on this religious view of obsessions, the logical treatment involved banishing the evil from the possessed person through exorcism. Exorcism was the treatment of choice, with the person being subjected to torture in an effort to drive out the intruding entity. Surprisingly, those treatments were occasionally successful ***(Aardema et al., 2007)***.

Obsessions and hand-washing rituals resulting from guilt were immortalized in the **17th** century in Shakespeare's character, **Lady Macbeth**. With time, the explanation of obsessions and compulsions moved from a religious view to a medical one. OCD was first described in the psychiatric literature by **Esquirol in 1838**, and by the end of the **19th** century, it was generally regarded as a manifestation of melancholy or depression ***(Fornaro et al., 2009)***.

By the beginning of the **20th** century, theories of obsessive-compulsive neurosis shifted towards psychological explanations. **Pierre Janet** reported successful treatment of rituals with behavioral techniques and with ***Sigmund Freud's*** writings on psychoanalysis of the **Rat Man in 1909**, OCD came to be conceptualized as resulting from unconscious conflicts and from the isolation of thoughts and behaviors from their emotional antecedents.

As a result of those theories, treatment of OCD turned from attempts to modify the obsessive symptoms themselves toward the resolution of the unconscious conflicts presumed to underlie the symptoms ***(Allee et al., 2000)***.

With the rise of behavior therapy in the **1950's**, learning theories which had proved useful in dealing with phobias were applied to OCD, and although they clearly did not account for all OCD phenomenology, they led to the development of the powerful techniques of exposure and response prevention for reducing compulsive rituals in the late **1960's** and early **1970's** ***(Fornaro et al., 2009)***.

OCD was initially considered as a sub-dimension of depression, the so-called "ananchastic depression." In the **1980s** this concept was questioned, demonstrating that only antidepressants with serotonin-reuptake inhibition activity were effective in treating obsessions and compulsions.

In the last years, there has been another important paradigm shift, including other neuro transmittorial systems in the putative pathophysiological mechanisms underlying OCD, such as dopamine, glutamate, noradrenaline, and GABA. This leads to the crucial hypothesis that OCD may be an etiologically hetero-generous condition, therefore being affected by a wide spectrum of comorbidities ***(Pallanti et al., 2011).***

**Epidemiology:**

OCD rate is fairly consistent, with a 12-month prevalence of 1.2% ***(Kessler et al., 2005).*** And life time prevalence 2-3 % of the general population. Epidemiological studies in Africa, Europe and Asia have confirmed these rates across cultural boundaries. Some researchers have estimated that OCD is about 10 % of outpatient's psychiatric clinics considering it the fourth most common psychiatric diagnosis ***(Kaplan et al., 2014)***.

OCD was identified as an anxiety disorder having the highest proportion (50.6%) of serious cases by the National Co morbidity Study Replication leading to global cause of nonfatal illness burden by the World Health Organization (WHO) in 2006. While also considered to be the ten most disabling medical condition worldwide ***(Ayuso-Mateos et al., 2006)***.

Single persons are more frequently affected than are married ones, although this finding probably reflects the difficulty of maintaining a relationship. OCD occurs less often among blacks than among whites ***(Kaplan et al., 2014)***.

The onset of symptoms is generally gradual. If OCD goes untreated, the course is typically chronic with waxing and waning symptoms, and remission rates are low (***Skoog and Skoog, 1999).*** Nearly 70% of patients report a continuous course of symptoms, and 23% experience a waxing and waning course ***(Pinto et al., 2006).***

## Pathophysiology of OCD:

The exact etiopathogenetic mechanism of OCD remains unclear. However, numerous research results now available, predominantly based on structural and functional imaging, indicate that in OCD a dysfunction of the cortico-striato-thalamo-cortical (CSTC) control loops and a corresponding imbalance of various neurotransmitters and -modulators are pathogenetically relevant. The serotonergic system, which innervates and modulates by inhibition the CSTC control loop, seems to be pathogenetically involved in at least some OCD patients ***(Mavrogiorgou et al., 2014).***

The pathophysiology of OCD involves multiple interacting risk factors, covering biological, psychological and psychosocial factors

### Neurobiological Factors:

Multiple evidences suggest that neurobiology plays a significant role in the etiology of OCD. Pharmacological and neurobiological studies have implicated several central neurotransmitter systems in the pathophysiology of OCD. The strongest pharmacological evidence concerns the serotonergic system and the well-established efficacy of potent serotonin reuptake inhibitors in the treatment of OCD; however, other systems have also been implicated.

A growing body of evidence suggests that the pathophysiology of OCD is complex and that despite the fundamental role played by serotonin (5-HT) in the pathogenesis of obsessions and compulsions, a serotonergic dysfunction may explain no more than 50% of the variability of the disease. The most widely accepted alternative neurochemical theory for OCD suggests that the dopamine (DA) neurotransmission system also may be important in the pathophysiology of some cases of OCD ***(Pauls et al., 2002).***

The most recent neurochemical theory for OCD is pinpointing to glutamate, the essential excitatory central nervous system (CNS) neurotransmitter .There is also a new etiologic hypothesis for OCD involving an autoimmune mechanism, particularly relevant for early-onset cases ***(Grados et al., 2015)***.

## I. Serotonin Hypothesis:

Historically, the serotonin hypothesis has its basis in the pharmacology of OCD. In the late **1960s** it was observed that clomipramine, the only tricyclic antidepressant with potent 5-HT reuptake blocking properties, had anti obsessional activity.

Nevertheless, the fact that not all OCD patients respond to clomipramine or SSRIs and approximately 40% of them have no clinical improvement may reflect the biological heterogeneity of the OCD ***(Pauls et al., 2002)***.

## II. Noradrenergic hypothesis:

A number of studies support the hypothesis that the serotonergic system is not the only system involved in the pathophysiology of OCD & it is possible that a balance of adrenergic and serotonergic action is necessary.

The serotonin and dopamine systems interact extensively, particularly in the basal ganglia, an area that has been implicated in the pathogenesis of obsessive-compulsive phenomenology by several studies. It is particularly known that serotonergic innervation regulates the dopamine activity of basal ganglia ***(Pauls et al., 2002).***

Preclinical, neuroimaging and neurochemical studies have provided evidence demonstrating that the dopaminergic system is involved in inducing or aggravating the symptoms that are indicative of OCD. Anecdotal reports show some improvement in OCD symptoms with use of clonidine, a drug that lowers the amount of nor-epinephrine However, currently less evidence exists for dysfunction in the noradrenergic system in OCD ***(Kaplan et al., 2014)***.

## III. Glutamate hypothesis:

Imaging studies have shown that glutamate imbalances characterize proposed pathophysiological pathways in OCD ***(Wu et al., 2012)***. Pharmacologic modulation of CNS glutamate is already showing efficacy in ameliorating OCD symptoms,

which are non-responsive to other treatment interventions ***(Wilhelm et al., 2008) (Krystal et al., 2010).*** Taken together these line of evidence to a significant contribution of glutamate-based mechanisms in OCD, possibly through the anatomic substrate known as the cortico-striato-thalamo-cortical (CSTC) loop **(*Grados et al., 2013*)**.

## IV. Neuro-immunology:

Some interest exists in a positive link between streptococcal infection and OCD. Group A β-hemolytic streptococcal infection can cause rheumatic fever, and approximately 10 to 30 % of the patients develop Sydenham's chorea and show obsessive-compulsive symptoms ***(Kaplan et al., 2014)***.

The observation of an association between Sydenham's chorea and OCD led to the characterization of the "pediatric autoimmune neuropsychiatric disorders associated with streptococcal infections" (PANDAS) by ***Swedo et al. (1998)***.

There has been little recent progress in this field ***(Dale et al., 2012),*** but opinion continues to include an immune system role in OCD proposing that exposure to streptococcus represents an "environmental cause" of OCD ***(Baganza et al., 2013)***.

## V. Other Biological Factors:

- In electroencephalogram a higher than usual incidence of nonspecific EEG abnormalities occurs in patients with OCD.
- Sleep EEG studies have found abnormalities such as decreased rapid eye movement latency.
- Neuroendocrine studies have also produced no suppression on the dexamethasone-suppression test in about one-third of patients and decreased growth hormone secretion with clonidine infusions ***(Kaplan et al., 2014)***.

### Genetic Factors:

Available genetic data on OCD support the hypothesis that OCD has a significant genetic component. However the data, didn't yet distinguish the heritable factors from the influence of cultural and behavioral effects on the transmission of the disorder ***(Kaplan et al., 2014)***.

There have been many family studies on OCD over the past 75 years. Data from the majority of family studies completed over the past 60 years suggest that OCD is familial. However, rates of illness among relatives vary from study to study ***(Pauls et al., 2002)***.

Family studies report prevalence rates of 7% to 15% in first-degree relatives of child and adolescent probands with

OCD. These findings are consistent with reports of an increased familial loading in probands with early age at onset ***(Hill et al., 2015)***.

## Neuroimaging Factors:

To date, neuroimaging research has been highly influential in advancing neurobiological models of OCD. Brain imaging measures have attributes that are well suited to this enterprise, enabling both objective and quantitative characterization of study participants. Perhaps more importantly, structural, functional and neurochemical brain measures promise to provide information that is mediating between genes and corresponding clinical phenotypes ***(Saxena et al., 2000)***.

Here it is noteworthy that several imaging studies have been performed to test hypotheses regarding differences in brain function between categorically defined subsets of OCD subjects, including studies of patients with/without comorbid major depression ***(Saxena et al., 2001).*** Early/later onset of OCD **(*Busatto et al., 2001).*** Or pure presentations of washing Vs checking **(*Phillips et al., 2000).***

***Mataix-cols et al in 2004*** used a symptom provocation paradigm with functional magnetic resonance imaging to investigate the neural correlates of washing, checking and