

## Research Article

# Variation in Neoplasm in Relation with Production of Different Types of Obsession and Compulsion

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## Abstract

**Purpose:** Find out common form and content of obsessions and compulsions in different neoplasms.

**Introduction:** After diagnosing individuals as a cancer warrior many patients start to follow their spirituality and overvalued ideas strictly. In obsessive compulsive disorder there is a strong connection with spirituality and overvalued ideas. In relation between carcinoma and obsessive compulsive disorder some tumor related to posterior cranial fossa, meninges can initiate obsessive compulsive symptoms. Some childhood brain tumor such as neuroblastoma is also related to obsessive compulsive disorder. Different obsessions and compulsions are caused by hypoactivation of different areas of brain, so different compulsions are found in various neoplasms.

**Methods:** Twenty-four individuals free of obsession and compulsion before diagnosing a case of malignancy have screened by using five screening questions of OCD known as Zohar Fineburg Obsessive Compulsive Screen (Z-FOCS) after diagnosing malignancy. Samples are collected from departments of oncology and pediatric oncology of Bangabandhu Sheikh Mujib Medical University.

**Results:** Among these 25 malignant individuals fifteen people are washing and cleaning a lot. Eight people check things a lot. Three people have any thought that keeps bothering them that they would like to get rid of but cannot. Three people take a long time to finish their daily activities. Seventeen people have orderliness or symmetry.

**Conclusion:** Usually obsessive compulsive disorder is related to posterior cranial fossa meningioma. But other types of carcinoma can initiate many obsession and compulsion. In this survey there is only a screening scale named Zohar Fineburg Obsessive Compulsive screening has used. For better assessment other module should be used to identify the relationship between OCD and Cancer accurately.

**Keywords:** Neoplasms; Cancer; Obsessive compulsive disorder; Brain tumor; Malignancy

## Introduction

Bangladesh is the 8<sup>th</sup> most populous country in the world, according to population statistics of 2019, and estimation is almost 168.07 million people. Bangladesh is the 10<sup>th</sup> densely populated country in the world. In Bangladesh, there are almost two lakh patients have newly diagnosed with cancer each year [1]. As an overview, lung cancer and mouth-oropharynx cancer rank as the top two prevalent cancers in males. Other types of cancers are esophagus cancer and stomach cancer. In women, cancer cervix uteri and breast cancer are most prevalent [2].

Religion (e.g. religious affiliation, service attendance) and spirituality (e.g. connection to a source larger than oneself, feelings of transcendence) are important aspects of everyday life for many people; a recent poll found that 59% of people worldwide describe themselves as religious, irrespective of whether they regularly attend religious services.

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Neoplasia is related to some themes such as differentiation, anaplasia, dysplasia, rate of growth, local invasion, metastasis, fatality, recurrence, and cachexia. Neoplasia proceeds without any stimulation and independently. Rate of growth of malignant tumor is too high and it has influenced by hormone sensitivity, blood supply, unknown influence and differentiation. On the other hand Obsessive Compulsive Disorder (OCD) is a persistent, repetitive thought, impulse and images that enter into the mind despite an effort to exclude them. This thought, impulse and images are totally intrusive, unwanted and nonsense. In details, according to diagnostic and statistical manual of mental disorder 5<sup>th</sup> edition Obsessions are defined by

1. Recurrent and persistent thoughts, urges, or images that are experienced, at some time during the disturbance, as intrusive and unwanted, and that in most individuals cause marked anxiety or distress.
2. The individual attempts to ignore or suppress such thoughts, urges, or images, or to neutralize them with some other thought or action (i.e., by performing a compulsion).

Compulsions are defined by

1. Repetitive behaviors (e.g. hand washing, ordering, checking) or mental acts (e.g. praying, counting, repeating words silently) that the individual feels driven to perform in response to an obsession or according to rules that must be applied rigidly [3].
2. The behaviors or mental acts are aimed at preventing or reducing anxiety or distress, or preventing some dreaded

event or situation; however, these behaviors or mental acts are not connected in a realistic way with what they are designed to neutralize or prevent, or are clearly excessive [4].

Obsession has some forms and contents. Forms of obsession are doubt, rumination, thought, impulse, phobia, slowness. Contents of obsessions are dirt and contamination, illness, orderliness, sex, aggression, religion. Hand washing and checking behavior are commonly found in OCD [5]. But other than these compulsive behaviors mental rituals, counting are also common. Avoidance compulsion is the severe form of compulsion. In OCD it has 2 specifiers. One is related to insight, which includes 3 insights. Good insight or fair insight means individual know that this thinking is not true, where poor insight means thinking is true, delusional insight means individual beliefs with full conviction that the beliefs are true. Another specifier is presence of tic or not. To find out obsession and compulsion in a cancer patient can be due to disease itself or can be due to other comorbidity such as pediatric autoimmune neuropsychiatric disorder due to streptococcal infection, Tourette disease, encephalitis lethargica, Parkinson's disease and others, and can be by chance. Though meningioma, glioma, ependymoma, neurofibromatosis have some evidence of having symptoms of obsession and compulsion but the mechanism is unknown. In obsession, thought of dirt and contamination, aggression, doubt and in compulsion washing and checking compulsion are common. When an individual has started to proliferate new cells, abnormal mutation in the posterior cranial fossa and meninges, it produces psychiatric symptoms as well as obsessive compulsive disorder [6,7]. But the other carcinomas are not directly related to OCD but metastasis can initiate OC symptoms. In different neoplasms there are variations of obsessive and compulsive symptoms. In some research there is some findings that in washing compulsion there is hypo-activation of cortico-cerebellar region and in checking compulsion there is hypo-activation of left caudate nucleus and left anterior cingulate gyrus. It is still not clear that is there any relation of different type of carcinoma with different type of obsession and compulsion.

## Results

Among twenty-five individuals there are twenty males and five females. Here 16 individuals with childhood carcinoma and 12 individuals with adult carcinoma. Mean age of childhood carcinoma is 8.643 years and mean age of adult carcinoma is 38.22 years (Figures 1 and 2). In childhood carcinoma there are 3 females and in adult carcinoma there are 2 females. From the individuals where diagnosed cases are mentioned that there is one carcinoma of mastoid process, two carcinoma of lung, one soft tissue sarcoma, one gonadal germ cell tumor, one hepatocellular carcinoma, six acute lymphoblastic leukemia, four acute myelocytic leukemia, one burkit lymphoma, three non-Hodgkin lymphoma, two breast cancer, two neuroblastoma.

## Discussion

Obsessive Compulsive Disorder (OCD) is a psychological disorder characterized by obsessional ideas and compulsivity, such as repeatedly and irresistibly performing the same tasks [8]. Although the pathogenesis of OCD has not been clarified, neuroimaging findings have suggested that cortico-striato-thalamic circuits play an important role with many case reports also supporting that notion. A group of researchers led by Johns Hopkins scientists say they have identified a genetic marker that may be associated with the development of obsessive-compulsive disorder (OCD), whose causes and mechanisms are among the least understood among mental illnesses [9,10].

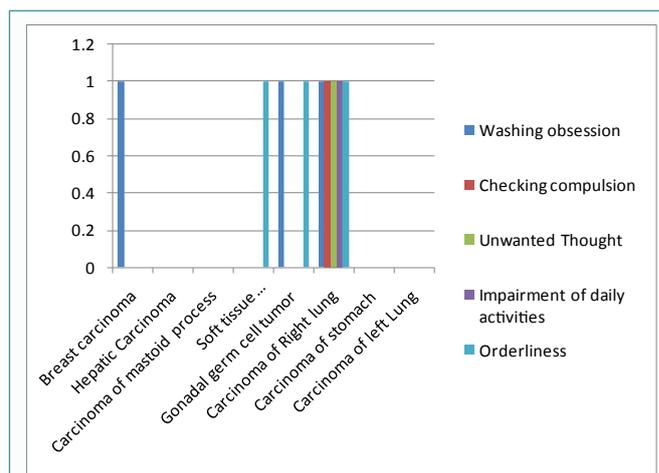


Figure 1: Presence of obsession and compulsion in various adult carcinomas.

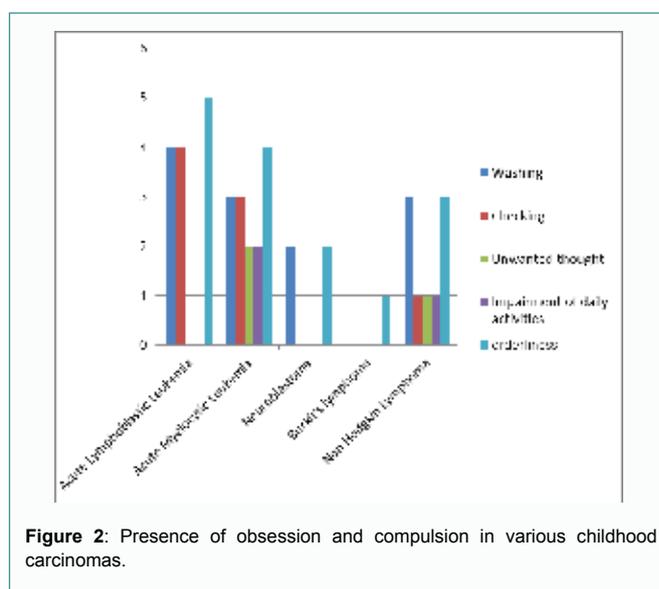


Figure 2: Presence of obsession and compulsion in various childhood carcinomas.

Specific cancer types (excluding patients whose cancer was diagnosed within the first year of OCD diagnosis) among the OCD patients, breast cancer was most common, followed by liver and biliary tract cancers and colon and rectum cancers. An increased SIR was observed for prostate cancer and bladder cancer. However, a decreased SIR was observed for uterine cancer. An increased SIR was observed among male OCD patients for prostate, bladder, and hematologic cancers. Among female OCD patients, a decreased SIR was observed for uterine cancer. However, an increased SIR was observed among OCD patients aged less than 19 years and within the first year of OCD diagnosis. The presented patient was diagnosed with a septum pellucidum cyst, OCD and depression [11,12]. The Checkers showed hypoactivation in the left caudate and left Anterior Cingulate Cortex (ACC) compared to the normal controls and a positive correlation between activated brain areas and symptom severity in the left ACC. The Washers showed hyperactivation in several bilateral cortico-cerebellar regions. Onset of OCD occurred after resection of meningioma of the right frontal lobe and who was treated successfully with paroxetine hydrochloride [13,14]. We suggest that the onset of secondary (organic) OCD is associated with the frontal lobe, and we propose that the origin of obsessions is located in the right frontal

lobe. Structural lesions of the basal ganglia may lead to Obsessive Compulsive Disorder (OCD).

Obsessive Compulsive Disorder due to a cavernous malformation hemorrhage is common in the dominant caudate head [15]. Onset of Obsessive-Compulsive Disorder (OCD) after the age of 50 years is rare, and should alert the physician to possible “organic” causes of OCD. These include infections, degenerative disorders, brain injury and cerebrovascular lesions, principally involving the frontal lobes and basal ganglia. In atypical presentation, lesions involving the cortical basal ganglia thalamic cortical circuit and the association with neurological signs/symptoms was characteristic. Obsessive-Compulsive Disorder can occur secondary to Brain Dysgerminoma in caudate nuclei.

It was found that GRIN2A, GRIN2B and GRIA2 are the most central nodes in the network. Functional and pathway enrichment analysis showed that glutamate-related pathways are the main deficient systems in patients with OCD. By studying genes shared between OCD and other diseases, it was cleared that OCD, epilepsy and some types of cancer have the most number of shared genes. A patient treated with dexamethasone for cerebral edema secondary to a cerebral tumor developed acute obsessive-compulsive behavior. The last two decades, studies done on the gene sequences, large-scale and point mutations and gene-gene, gene-environment and gene-drug interactions have led to the discovery of hundreds of genes associated with OCD. Although each gene in turn is a part of the etiology of this disorder; however, OCD, like other mental disorders is complex and a comprehensive and integrated view is necessary to understand its genetic basis. In this study, through an extensive review of existing published studies, all genes associated with OCD were found. Then, in order to integrate the results, all the interactions between these genes were explored and the achievement was represented as an interactive genetic network.

It is also found that there are transient feelings of compulsion caused by hemispheric lesions. Copy Number Variations (CNVs) have been previously associated with several different neurodevelopmental psychiatric disorders, such as autism, schizophrenia, and attention deficit hyperactivity disorder (ADHD). The present study consisted of a pilot genome-wide screen for CNVs in a cohort of 16 patients with early-onset Obsessive-Compulsive Disorder (OCD) and 12 mentally healthy individuals, using array-based Comparative Genomic Hybridization (aCGH) on 44K arrays. A small rare paternal inherited microdeletion (64 kb) was identified in chromosome 15q13.3 of one male patient with very early onset OCD and no family history [16]. The deletion encompassed part of the FMN1 gene, which is involved with the glutamatergic system. This finding supports the hypothesis of a complex network of several genes expressed in the brain contributing for the genetic risk of OCD, and also supports the glutamatergic involvement in OCD, which has been previously reported in the literature.

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