

## URINARY TRACT INFECTIONS AND COMORBIDITY IN CHILDREN: A RETROSPECTIVE STUDY

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### ABSTRACT

**Introduction:** Urinary tract infections (UTIs) are common infections in all childhood including the newborn period, and they are related with considerable mortality and morbidity. In this study our aim is to emphasize the importance of UTIs that even if there are other diseases that may explain the present complaints and findings.

**Methods:** The study was carried out with 100 patients (mean age=54.73 month, SD=48.47) who were hospitalized between May 2003 and May 2005. A detailed physical examination, gastric microscopy and gaita cultures, anterior posterior chest X-Ray, anthropometric measurements, CRP test, serum leukocyte levels, ultrasound (US), scintigraphy and voiding cystourethrography (VCUG) were performed in order to investigate the accompanying diseases.

**Results:** While urinary tract system complaints are seen in 29% of the cases, non-urinary tract symptoms are seen in 15% and 50% of the patients had both complaint types. When we examine the urinary tract system symptoms, 32% of the cases complaint with disuria, 19% polyuria, 63% abdominal pain and 13% pollacuria. On the other hand non-urinary symptoms were diarrhea (10%), cough (24%), hypertension (10%), cardiovascular disease symptoms (CVD) (27%) and fever (53%). In addition 14% of the cases suffering from protein energy malnutrition, 19% acute gastroenteritis, 22% lower respiratory tract infection and 13% central nervous system (CNS) anomaly. When we examine the US results of 90 patients; 53.3% were evaluated as normal; 16,7% had Grade 1-2 pelvicaliectasis and 18,9% had grade 3-4 pelvicaliectasis. The VCUG results of 51 cases were as follows; 60,8% normal, 17,6% grade 1-3 (low grade), 17,6% grade 4-5 (high-grade) vesicoureteral reflux(VUR) was detected. Scintigraphic examination revealed 40% normal, 22,5% scar and 47.5% loss of activity.

**Conclusions:** UTI is one of the major cause for chronic disease in childhood and related with serious complications. This study shows that even if the patient has a disease that will explain the complaints, the UTI may also be accompanied. Therefore by the appropriate treatment of the associated UTI with the further examination might be life saving for the patient.

**Keyword:** Urinary Tract Infections, Children, Comorbidity

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### INTRODUCTION

Urinary tract infections (UTIs) are one of the most common infections in all childhood including the newborn period, and it is related with considerable mortality and morbidity. UTI defined as bacteriuria accompanying with its symptoms. Although there is debate on the threshold level, bacterial growth of more than 10<sup>5</sup> is considered as UTI. Pyuria may be sometimes absent. Asymptomatic

bacteriuria needs no treatment or investigation. There is evidence that infants suffering with UTIs have lower bacterial counts. UTI is the most common bacterial infection in childhood under the age of 2 years and it may be the first sign of VUR and the other congenital anomaly of the urinary tract. Over the decades, rapid diagnostic approaches and the use of the effective new generation antibiotics have led to facial results with almost no mortality. Despite these successes in the treatment, recurrent

## INTRODUCTION

OCD is defined as the presence of obsessions and/or compulsions that are time consuming and /or cause clinically significant distress or impairment in functioning. Obsessions are characterized by recurrent unwanted and persistent thought images and impulses whereas compulsions are repetitive ritualistic behaviors or covert acts that are performed in response to obsessions or to relieve distress[1]. The content of the obsessions and compulsions varies among individuals with OCD, however there are five themes that are commonly experienced across both children and adults: contamination, symmetry/ordering, forbidden or taboo thoughts, harm and hoarding [2,3]. Both adults and children with OCD, vary in terms of insight related to the accuracy of their dysfunctional beliefs, ranging from acknowledging the fact that the beliefs are irrational to being completely convinced the beliefs are true. In children especially below 7 years of age, appropriate lack of metacognition oftentimes contributes to limited insight into the irrationality of their beliefs [4].

Between 0.25 and 4 % of all children and adolescents are affected from OCD. In British Child Mental Health Survey, which has more than 10000 children and adolescent participant, almost 90% of cases identified that undetected and untreated. Lower socioeconomic status and lower intelligence quotient have found associated with OCD in youth. There are two peaks of OCD incidence across the life span, one is in preadolescent children and a later peak in early adult life. Childhood onset appears in at least 30-50% cases [5]. Pediatric OCD causes significant functional impairment and reduced life quality with sustained functional impairment for those who are insufficiently treated. Comorbid diagnosis that include anxiety disorders, tic disorders, attention deficit hyperactivity disorder, disruptive behavior disorders and major depressive disorder, are also common at youth with OCD.

In the etiology of obsessive-compulsive disorder, genetic, neurochemical, and psychosocial factors play a role. The concept of insight is also important in OCD, since it creates a difference in many areas from clinical appearance to treatment response. It is known that patients with limited insight had more severe symptom level and loss of function, and their response to drug treatment was worse. Many clinical features, such as symptom severity, number of compulsions, chronic course, early onset age, are associated with the level of insight[6]. Pharmacological agents and cognitive behavioral therapy are preferred for treatment. Although

there are lots of researches about cognitive underpinnings of OCD in adults, there is comparatively limited research into the underlying mechanisms associated with the persistence and maintenance of this disorder in childhood[7]. That's why, further investigation about maladaptive beliefs, to understanding the development of such beliefs and familial processes involved in childhood OCD symptoms would be important.

## METHOD

### Participants and Procedure

Adolescent (n=264) were recruited from secondary and high schools in Istanbul, Turkey. The study sample comprised adolescents aged 12 to 16 years (132 male, 132 female). Mean age of the sample was 13.56 (SD±1.11) years. There was no significant difference between male and females in regarding to age ( $p=0.349$ ;  $t=-0.938$ ). Written informed consent was obtained from parents and respondents. The study procedure received the approval of local committee.

### Instruments:

**Obsessive Compulsive Inventory-Revised (OCI-R):** The OCI-R is an 18-item self-report questionnaire assessing the degree of bothered or distressed by OCD symptoms over the past month on a 5-point scale from 0 (not at all) to 4 (extremely) [8]. The OCI-R yields scores across six factors: 1) washing 2) checking 3) obsessions 4) mental neutralizing 5) ordering and 6) hoarding. The Turkish version of the scale have demonstrated to have good reliability and validity [9].

**Obsessive Beliefs Questionnaire-Child Version (OBQ-CV):** The OBQ-CV [Coles 2010] is a self-report measure consisting of 44 items developed to assess maladaptive beliefs central to OCD. Items of the adult version of the OBQ were modified by Coles et al. to adapt the psychometric tool for a more reliable use in children and adolescents [10]. Distinct from adult version, items of OBQ-CV are rated on a five-point measure ranging from 1 to 5. The Turkish version of the scale have demonstrated to have good reliability and validity[11].

**Meta-Cognitions Questionnaire for Children (MCQ-C):** The MCQ-C is a 24 item shortened and modified version of the Meta-Cognitions Questionnaire for Adolescents[12]. Items are rated on a four point measure ranging from 1 (do not agree) to 4 (agree very much). The Turkish version of the MCQ was statistically significantly associated with the measures of anxiety and obsessive-compulsive

symptoms. Internal reliability coefficient was 0.73 and test-retest reliability correlation was 0.82 [13].

**State Trait Anxiety Inventory for Children (STAI-C):** The STAI-C is a self-report measure that has been widely used to assess state and trait anxiety in children and adolescents [14]. The STAI-C items are rated on a 3-point rating scale ranging from 1 to 3 (3-often, 2-sometimes and 1-hardly ever). Each scale yields a score from a minimum of 20 to a maximum of 60. The validation study of the Turkish version was conducted in a school community sample by Ozusta [15]. The test-retest reliability of state anxiety subscale was 0.60 and that of the trait anxiety subscale was 0.65. The internal consistency was respectively  $\alpha=0.82$  and  $\alpha=0.81$ . The Turkish version was reported to having high discriminant validity in distinguishing afflicted children from children without any disorder.

**Statistical Analyses**

In addition to the descriptive statistics of means, standard deviations and percentages, pearson's correlation coefficients and linear regression analyses were used to test the study hypotheses.

**RESULTS**

Mean scores of scales are shown according to gender in Table 1. The means and SDs of each domain from OCI-R, OBQ, MCQ, and STAI are represented. The mean scores of subscales of OCI-R and OBQ are not different in regarding to gender ( $p>.05$ ). However, state and trait anxiety are differed ( $p<.05$ ). In addition, MCQ-Positive and MCQ-Negative are differed ( $p<.05$ ).

**Table1:** Psychological variables

	Girl		Boy		p
	Mean	Std.Deviation	Mean	Std.Deviation	
OCI_R_Washing	5,57	2,85	6,05	3,16	,199
OCI_R_Obsession	5,35	3,11	5,31	3,24	,923
OCI_R_Hoarding	4,96	2,82	5,12	3,11	,679
OCI_R_Sequence	6,31	3,13	6,96	3,32	,099
OCI_R_Control	5,82	3,06	5,5	3,24	,403
OCI_R_Neutralize	3,66	3,51	3,37	3,07	,479
OCI-R-Total	31,7	13,63	32,01	13,89	,853
OBQ_Response_Threat	76,96	12,87	77,08	12,81	,943
OBQ_Certainty_Control Thought	41,71	10,9	40,56	11,24	,406
OBQ_Perfectionism	26,9	6,09	25,43	6,06	,051
MCQ_Positive	12,82	4,13	11,24	4,18	,003
MCQ_Negative	13,79	4,07	15,06	4,56	,020
MCQ_Superstition	14,52	3,93	14,46	3,89	,897
MCQ_Monitor	15,87	4,03	16,1	3,69	,636
STAI_State	34,23	6,83	36,33	8,04	,033
STAI_Trait	37,69	8,4	40,56	8,06	,010

**Table2:** Correlation between obsessive compulsive symptoms, and obsessive beliefs, metacognition and anxiety

	AGE	OBQ Response Threat	OBQ Certainty Control Thought	OBQ Perfectionism	MCQ Positive	MCQ Negative	MCQ Superstition	MCQ Monitor	STAI-State	STAI-Trait
OCI_R_Washing	-.236	.229	.361	.345	.294	.336	.334	.298	.012	.196
	.000	.000	.000	.000	.000	.000	.000	.000	.853	.003
OCI_R_Obsession	-.004	.109	.377	.138	.333	.510	.516	.341	.372	.568
	.944	.076	.000	.025	.000	.000	.000	.000	.000	.000
OCI_R_Hoarding	.001	.006	.261	.101	.312	.408	.423	.356	.278	.509
	.988	.921	.000	.102	.000	.000	.000	.000	.000	.000
OCI_R_sequence	-.164	.256	.375	.268	.312	.394	.415	.383	.077	.301
	.007	.000	.000	.000	.000	.000	.000	.000	.244	.000
OCI_R_Control	.040	.279	.377	.336	.350	.263	.246	.344	.031	.245
	.040	.000	.000	.000	.000	.000	.000	.000	.643	.000
OCI_R_Neutralize	-.091	.024	.373	.136	.426	.363	.387	.302	.227	.322
	.134	.703	.000	.027	.000	.000	.000	.000	.001	.000
AGE		-.025	-.177	-.160	.069	.073	.107	.046	.157	.077
		.686	.004	.008	.268	.238	.086	.460	.015	.243

Table 2 shows correlations between OCI-R and OBQ, MCQ, STAI scores and age. As Table 2 shows, the correlations between scales are mild level, the correlation between age and scales are not associated.

To determining whether OCD severity (OCI-R total) are predicted by, age, gender, metacognitive beliefs (MCQ), obsessive beliefs (OBQ) and state and trait anxiety predicted, a linear regression was conducted. Our findings demonstrated that age ( $\beta = -.199$ ,  $t = -3.750$ ,  $p < .001$ ), obsessive beliefs about certainty/control of thought ( $\beta = .180$ ,  $t = 2.714$ ,  $p = .007$ ), and the metacognitive dimensions of positive belief of anxiety ( $\beta = .159$ ,  $t = 2.724$ ,  $p = .007$ ) and superstition\* ( $\beta = .254$ ,  $t = 3.374$ ,  $p = .001$ ), and trait anxiety ( $\beta = .330$ ,  $t = 4.220$ ,  $p < .001$ ) predicted 56.9% of the variance in OCD severity (Table 3).

**DISCUSSION**

In this study we aimed to investigate the relationship of obsessive beliefs and metacognitions with obsessive compulsive symptoms at adolescents who have these symptoms. We have found the correlations that is mild level between OCI-R and OBQ, MCQ, STAI scores. In the light of our data, we did not observe a gender difference in terms of obsessive symptoms and obsessive beliefs. However, in our sample, state and trait anxiety scale scores were found to be higher in males than females.

In adults, there are reported association between OCD symptoms and cognitive beliefs such as contamination with responsibility/threat estima-

**Table 3: Logistic Regression Analysis**

Model	R	R Square	Adjusted R Square	Beta	t	Sig.	95.0% Confidence Interval for B	
							Lower Bound	Upper Bound
	.773	.597	.569					
(Constant)				.826	.410		-12.268	29.908
Age				-.199	-3.750	.000	-3.638	-1.128
Gender				.016	.301	.764	-2.589	3.522
OBQ-Response Threat				-.015	-.239	.812	-.158	.124
OBQ-Certainty Control Thought				.180	2.714	.007	.064	.404
OBQ-Perfectionism				.079	1.213	.227	-.111	.464
MCQ_Positive				.159	2.724	.007	.146	.919
MCQ_Negative				.139	1.840	.068	-.032	.905
MCQ_Superstition				.254	3.374	.001	.382	1.463
MCQ_Monitor				.056	.850	.396	-.275	.691
STAI_State				-.138	-1.851	.066	-.537	.017
STAI_Trait				.330	4.220	.000	.297	.819

tion beliefs, symmetry with perfectionism/certainty beliefs, unacceptable thoughts with importance/-control of thoughts beliefs and symptoms related to being responsible for harm with responsibility/threat estimation beliefs.<sup>15</sup> However there are limited knowledge about relationship between OCD symptoms and cognitive beliefs in children and adolescent, Barrett & Healy (2003) found that biases for cognitive control were significantly higher in children with OCD compared to anxiety disorders and a non-clinical group<sup>[16]</sup>. Similarly, another study showed that adolescents with OCD had significantly higher scores on inflated responsibility, thought-action fusion (likelihood), and one aspect of perfectionism (concern over mistakes) than control group. In addition, inflated responsibility independently predicted OCD symptom severity<sup>[17]</sup>. Some studies revealed inflated responsibility were reported correlated with OCD symptoms in adolescent while others not<sup>[18]</sup>. Coles et al. reported relationship between obsessive beliefs and self-reported OCD severity in children<sup>[10]</sup>. In the study about validation of the Obsessive - Belief Questionnaire - Child Version, the results support for a relationship between beliefs (OBQ-CV total scores) and self-reported OCD severity in non-clinical population. However, total scores were not significantly correlated with OCD severity total scores or compulsion scores, and there was only borderline significance in obsession scores<sup>[11]</sup>. In addition, increased responsibility, threat severity, and cognitive control were significantly found higher in OCD and other

anxiety disorders than non-clinic healthy controls<sup>[19]</sup>. While the child studies collectively provide preliminary support for a role of maladaptive beliefs, the results are a bit inconsistent at samples, study methodologies, and age groups. We have found the correlations that is mild level between OCI-R and OBQ, MCQ, STAI scores and we have seen that no association between age and these scales. In the linear analysis, it was found that the severity of OCD symptoms was inversely related to age and obsessive beliefs about certainty/control of thought, the metacognitive dimensions of positive belief of anxiety, superstition, and trait anxiety could predict the severity of obsessive symptoms. In terms of meta-cognitive beliefs, both adolescents and adults report a variety of these beliefs and most of these beliefs are related to obsessive symptoms in non-clinical populations. Most of previous studies about meta-cognitive beliefs of adults show that positive beliefs of anxiety have predicted OCD symptoms. Superstitions have not previously been found to predict obsessive symptoms in adult participants and that's why this needs more researches in order to determine whether this is a developmental difference<sup>[20]</sup>.

Although studies on this subject are generally on adults, researches have been started on cognitive backgrounds of OCD symptoms of children and adolescents in recent years. However, the data in the literature varied, the contribution of obsessive beliefs and positive belief of anxiety and superstitions to the severity of symptoms was supported in similar studies. Our results are consistent with the literature and provide a basis for further research.

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