

The relationship between anxiety and immunity in onco-pediatric patients.

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1. Introduction

Pediatric onco-hematology is a rare specialty with a high psycho-social impact. These pathologies can affect not only the patient, but family members also, with repercussions on everyday life, basic functions, and even immune responses.

Anxiety disorder is the most frequent mental health problem in the childhood and adolescence, with a 15-20% rate at some point in life, if it is ignored, it can persist long-term, even in the adult period. There are different types of anxiety disturbance: separation anxiety, selective mutism, specific phobias, social anxiety, drug-induced anxiety, medical conditions induced anxiety, panic disorder, agoraphobia, generalized anxiety, school avoidance.

In case of the onco-pediatric patients, the long period of admittance, isolation from other family members, uncertainty about their future, chemo- and radiotherapy, but also intrathecal Methotrexate administration, primary CNS tumors or secondary determinations have direct effects on psychological functions. The effect of stress and anxiety on immunity is suggested by the fact that stress hormones decrease proinflammatory immunity, and increase anti-inflammatory immunity through elevated proinflammatory cytokines (IL-1, IL-6, TNF alfa) and low level of anti-inflammatory cytokines (IL-10, IL12).

2. Aims

To evaluate the frequency of anxiety in oncologic pediatric population, to identify different anxiety types and compare these data with anamnestic data in order to identify certain factors that influence anxiety. Another question that we would like to answer, is that anxiety does influence immunity?

3. Material and methods

We tested 96 onco-pediatric patients from 5 Hemato-Oncologic centers from Romania and 101 children without chronic pathology as a control group.

The measuring instrument for anxiety was the SCARED child test, conceived by Dr. Boris Birmaher in 1997, which can be used without a special license and an own conception questionnaire for anamnestic data for the patient group. Through the 41 items, we can measure 5 types of anxiety: panic disorder, generalized anxiety, separation anxiety, social phobias and school avoidance.

The IL-6, IL-10, IL-1 beta, IL-12 (p40) and TNF-alfa levels were measured with xMAP technique- Flexmap 3D (Luminex Corporation, Austin, USA), the CRP levels were determined with the BN Pro Spec nephelometer.

4. Results

We had 197 tests, 96 onco-pediatric patients from 5 hemato-oncology pediatric centers from Romania aged between 7-21 years (mean 13.2 y, SD 3.42) and 101 participants without chronic disease for control group aged between 7-18 years (mean 12.93 years, SD 3.22). The descriptive statistics in the two studied groups prove the statistically significant difference in the incidence of anxiety, respectively in the distribution of the anxiety types. Statistical significant was the difference related to the anxiety level between the two compared groups $p=0.001$. At the hemato-oncologic patient's group we found 4 types of anxiety, in the control group all 5 types of the disorder were present, so we had statistically significant difference $p=0.016$. The anxiety-gender relationship in both groups is statistically non-significant (patients $p=0.421$ /control group $p=0.121$).

According to the anxiety types related to age groups, we found data with no statistic significance ($p=0.537$), however, we can observe, that under 13 years separation anxiety is more frequent. Treatment complexity correlated with types of anxiety brings statistically non-significant difference ($p=0.061$). Mother's studies and the anxiety score shows statistical significant data ($p=0.047$), conversely to anxiety score and the presence of siblings in the family, this difference is not statistically significant ($p=0.241$).

IL-1 beta, IL-6 TNF- alfa and CRP levels showed us a weak positive correlation in the anxious group, IL-10 and IL-12p40 levels suggest a weak negative trend in the non-anxious group.

5. Discussion

The specific literature is relatively poor from this point of view, only a few articles are studying the presence of anxiety in the onco-pediatric group or their relatives. The SCARED measuring instrument is a test which does not need any special license to be used, and it is free, compared to other anxiety measuring tests.

The presence of the Central Venous Catheter was in 63.54%, this dispositive is extremely important for oncologic patients in order to prevent the irritating effects of chemotherapeutic drugs on veins and it is not an anxiety trigger.

Our main hypothesis, that onco-pediatric patients are more anxious than population without any chronic pathology, is confirmed by our data with 36,46% (nr.35) patient with any type of anxiety, versus control group with 14.9% (nr.15), a fact also proven by the specific literature (9-32%).

Comparing the types of anxiety in the two studied groups we found a statistically significant difference, in the patient group there were 4 types of anxiety with separation anxiety dominancy, in the control group, there were 5 types of anxiety. Separation anxiety is adjusted by the small age at diagnosis, personalizing the room with toys and objects from home can help. Anxiety types correlated with age groups showed us a greater frequency of separation anxiety in the age group under 13 years, confirmed also by the specific literature.

The mother's studies and anxiety relationship showed us statistically significant data, patients with mothers with a maximum of 12 years of school were more anxious than patients with mothers with higher studies. This fact was not studied yet in the literature.

The cytokine level correlations need to be interpreted restrictively because of the small number of enrolled patients.

6. Conclusions

Psicho-oncology is a relatively young specialty with few studies in the last two decades. Anxiety affects children and adolescents with or without chronic diseases but is more frequent in the onco-pediatric population.

Central venous lines do not trigger anxiety.

In an oncologic population, there are 4 types of anxiety (with separation anxiety preponderancy, without school avoidance) compared to the healthy population (5 types of anxiety, panic disorder preponderancy).

Under 13 years separation anxiety is the most frequent anxiety disorder.

The mother's education level has an important influence on the child's anxiety.

In our included onco-pediatric centers 1 of 3 patients suffers from anxiety. Knowing, that fear is strongly related to anxiety, our admitted patients need optimal conditions to minimizing fear (medical staff, sedation, small, intimate hospital rooms).

IL-1 β , IL-6, TNF- α have increased values in the presence of anxiety, IL-10 and IL-12p40 have low levels in mental disorders.