"Inadequate Tranquility" as a Latent Form of Anxiety in Children and Adolescents

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Abstract

In the article school anxiety is considered as a component of school disadaptation and as a personal formation. The phenomenon of school disadaptation is getting more widespread nowadays, indicating that there is a disparity between students' social, psychological and physiological status and the requirements of school environment. It is confirmed that there are 2 risk groups: manifestly anxious and latently anxious or inadequately tranquil children. Aggression is often a specific form of behavior in the case of hidden anxiety. The aim of the study is to find psychophysiological markers of hostility and anger in inadequately tranquil adolescents. The study involved 66 students (23 of them were included in the inadequately tranquil group) of 9th and 10th grades of Moscow secondary school, whose average age was 15.3±0.7 years old. We used Bass-Perry's Aggression Questionnaire to assess levels of hostility and anger, and recorded EEG in Pz and ECG at rest with closed and open eyes. In the inadequately tranquil group anger correlated with the stress index, the index of autonomic balance, LF% and LF/HF ratio negatively and with HF and HF% positively. Hostility correlated with the stress index, the amplitude of maximum peak of alpha activity and LF% negatively and with HF% positively. Thus, in this group the tension of the regulatory system is not detected. However, over time the inadequate tranquility can change into manifest anxiety. This group requires further observation. In addition, aggression and hostility are seen as a coping strategy, that is realized by the students in order to regulate their condition and reduce mental stress in a stressful situation.

Keywords: inadequate tranquility; normative anxiety; explicit anxiety, hostility; stress index; heart rate variability.

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1. Introduction

The phenomenon of school disadaptation is getting more widespread nowadays, indicating that there is a disparity between students' social, psychological and physiological status and the requirements of school environment. A.M. Prikhozhan (Prikhozhan, 2009) identifies 2 main risk groups: manifestly anxious and latently anxious or inadequately tranquil children. Over time the inadequate tranquility can change into psychosomatic symptoms or specific behavioral forms: aggression, indifference to current events, excessive dreaminess, exaggerated laziness, etc. The authors describe this phenomenon as "suppressed", "denying" anxiety (Osnitsky & Tarasova, 2011).

Psychologists and sociologists report the increasing rate of aggressive behavior among adolescents (Ju, Osnitsky & Enikolopov, 2017). Aggression is often a specific form of behavior in the case of hidden anxiety. There are a lot of researches on hostility that is defined as a negative semantic personal attitude to another person (Rafanelli, Gostoli, Tully & Roncuzzi, 2016). Hostility and aggression are factors of predisposition to aggressive behavior that can refract variously: physically, verbally or indirectly.

Anxiety, hostility and aggression are often considered in different aspects such as social, psychological, physiological. However, students' school adaptation depends on their physiological status, psychosomatic unity. The physiological marker of the latent anxiety is the stress index of regulatory systems. In this regard, it is essential to define a set of psychological and physiological parameters for identification and monitoring of school anxiety, aggressive behaviour and, as a consequence, disadaptation.

The aim of the study is to find psychophysiological markers of hostility and anger in inadequately tranquil adolescents and students with normal anxiety.

2. Methods

2.1. Participants and procedure

The study involved 66 9th and 10th grade students of Moscow secondary school, whose average age was 15.3±0.7 years old. The psychological and physiological surveys were conducted individually.

All the subjects gave their informed consent before they participated in the study.

The data collection was completed between November and December 2015. The students filled up the questionnaires in a classroom within 20-30 min.

2.2. Instruments

We used Prikhozhan's Personal Anxiety Scale for 13–16-year-old students (Prikhozhan, 2002) and Bass-Perry Aggression Questionnaire (Buss & Perry, 1992) to assess levels of physical aggression (self-report on tendency to physical aggression in behavior (behavioral component)), anger (self-report on tendency to irritability (emotional component)) and hostility (this scale includes 2 subscales: suspicion and alienation (cognitive component)).

According to the level of school anxiety we divided all the participants into 2 groups: inadequately tranquil – 23 students and adolescents with normal anxiety level – 43 students. We conducted a pathopsychological survey of the inadequately tranquil students.

EEG in Pz and ECG were recorded at rest during 5 min with eyes closed and 5 min with eyes open. The examination was conducted using Neuro-KM machine, Russia. The analysis included the individual frequency and the amplitude of maximum peak of alpha activity for each participant. As for the heart rate variability (HRV), the following characteristics were analyzed: the stress index, the index of

autonomic balance, the regulation process adequacy, the heart rate, low frequency power (LF, 0.04-0.15 Hz) and its percentage in total power (LF%), high frequency power (HF, 0.15-0.4 Hz) and its percentage in total power (HF%), LF/HF – ratio of absolute LF power to HF power.

2.3. Statistical analysis

The statistical analysis was performed with SPSS (version 21.0). The differences in variables between the groups were tested using Mann-Whitney U test. Spearman's correlation was used to correlate EEG and ECG measures with anger and hostility within the groups. The statistical significance was considered to be $p < 0.05$.

3. Results and Discussion

At fist, all the participants were divided into 2 groups according to their hostility level. Then we analyzed the difference between the students with low (less than 20 points) and high (20 and more points) hostility. We observed that the students with high hostility had higher levels of self-assessment ($p < 0.05$), interpersonal ($p < 0.05$) and magical anxiety. But it was surprising that the adolescents with high hostility had lower level of the regulation process adequacy, which meant that their parasympathetic nervous system was more active. Apparently, such adolescents regulate their physical and emotional condition and reduce physiological tension by demonstrating hostility.

Then, according to the level of school anxiety we divided all the participants into 2 groups: adolescents with normal anxiety level and inadequately tranquil ones.

In the inadequately tranquil group anger significantly correlated with the stress index ($r=-0.490$, $p < 0.05$), the index of autonomic balance ($r=-0.469$, $p < 0.05$), LF% ($r=-0.658$, $p < 0.01$) and LF/HF ratio ($r=-0.582$, $p < 0.05$) negatively and with HF ($r=0.528$, $p < 0.05$) and HF% ($r=0.526$, $p < 0.05$) positively. Hostility correlated with the stress index ($r=-0.472$, $p < 0.05$), LF% ($r=-0.475$, $p < 0.05$) and the amplitude of maximum peak of alpha activity ($r=-0.517$, $p < 0.05$) negatively and with HF% ($r=0.469$, $p < 0.05$) positively.

Thus, in this group the tension of the regulatory system is not detected. Furthermore, there is prevalence of parasympathetic influences. However, according to Prikhozhan (Prikhozhan, 2009), over time the inadequate tranquility may change into manifest anxiety. This group requires further observation.

In the group of students with normal anxiety physical aggression and anger significantly correlated with alpha-2 band width ($r=0.518$, $p < 0.001$; $r=0.288$, $p < 0.01$) positively. Hostility significantly correlated with the stress index ($r=0.351$, $p < 0.05$), the index of autonomic balance ($r=0.373$, $p < 0.01$) and the regulation process adequacy ($r=0.340$, $p < 0.05$) positively. These results demonstrate the intensification of sympathetic influences in the autonomic nervous system when hostility increases.

Thus, the results of our study don't contradict the literature data. Anger, hostility and other individual factors of neuroticism are not always directly associated with HRV variables (Sobański et al., 2016).

Inadequate tranquility is a special form of anxiety and functions as a strong personal protection mechanism when psychosomatic or mental health are threatened. Psychological protections decrease mental stress and can take the form of suppression, denial, projection, rationalization, etc. Personal psychological protections are often unconscious and correlate with coping strategies which are mostly conscious. Using coping strategies, people can regulate their psychosomatic condition in a stressful and/or conflict situation (Leonova & Kuznecova, 2007).

Apparently, the adaptation process impairment and the reduced stress resistance are characteristic for inadequately tranquil adolescents because their regulatory systems don't strain when anger and hostility get more intensive.

At the same time in the group with normal anxiety the intensification of hostility logically causes the intensification of sympathetic activity of the autonomic nervous system, which means that the organism has some adaptive reserves. In addition, aggression and hostility are seen as a coping strategy, that is used by students in order to regulate their condition and reduce mental stress in stressful situations (Gutierrez-Garcia & Calyo, 2016). For example, legitimization of aggression and permissibility of aggressive actions can reduce mental stress.

4. Conclusions

Psychophysiological indicators of students' hostility include the stress index, the index of autonomic balance and the regulation process adequacy. In the inadequately tranquil group increased anger and hostility are strongly associated with reduced stress index and others physiological indices, which is the evidence of decreased physiological adaptation. In the group with normal anxiety there is positive relationship between hostility and the stress index, the index of autonomic balance and the regulation process adequacy, which is the evidence of increased sympathetic activity of the autonomic nervous system.

Disclosure: The authors declare that there are no competing interests.

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