Risk factors for aggressive behaviour in children with ADHD

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ABSTRACT:
The presence of ADHD in children is a significant risk factor for the development of conduct disorder (TC), chronic aggressive behaviour and antisocial behaviour. Studies have shown that aggressive behaviour has a high prevalence and is one of the most difficult to treat ADHD symptoms in children and adolescents who require psychiatric evaluation and intervention.

Our paper examined the demographical, socioeconomic and clinical factors related to a specific pattern of aggressive behaviour: hetero-aggressive behaviour (verbal and physical) or auto-aggressive behaviour in children with ADHD.

Clinical material and method
We analyzed prenatal risk factors, family medical history, developmental milestones, social and familial environment, school performance, peer relationship and their correlation with a certain type of aggressive behaviour and symptoms severity in a clinical sample of 124 patients, aged 5 to 14 years. All the patients had a positive diagnosis of ADHD based on DSM-IV criteria for ADHD. Their assessment included complete psychiatric and clinical evaluation, child and parents interviews, Child Behaviour Checklist for ages 6-18, Stony Brook inventory (parent version) and Disruptive Behaviour Assessment Scale (parent and teacher version).

We didn’t consider as eligible individuals with IQ < 50 and severe somatic or neurological comorbidities.

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Data were statistically processed performing A-NOVA analysis of variance and Chi-Square test for qualitative variables.

Descriptive statistics were performed for socio-demographic factors.

**Results**

Physical aggressive behaviour was statistically significant (p-value < 0.05) correlated with socioeconomic factors (p= 0.047), family emotional environment and parenting skills (p= 0.038) behavioural problems and peer relationship (p= 0.0005) and severity of ADHD symptoms (p= 0.007). Verbal aggressive behaviour was well correlated (p-value < 0.05) with educational performance (p= 0.004), behavioural problems and peer relationship (p= 0). We also found statistically significant correlations between auto-aggressive behaviour and family emotional environment and parenting skills (p= 0.0046), socioeconomic factors (p= 0.032) and the parents’ educational level (p= 0.0002).

There were no statistically significant correlations between hetero-aggressive (verbal and physical) or auto-aggressive behaviour and factors related to pregnancy and birth circumstances, family medical history of somatic or psychiatric illnesses and severity of ADHD symptoms.

**Conclusions**

Our findings suggest that familial factors (family functioning, educational level, socioeconomic status, parenting skills) play an important role in the development of both physical and auto-aggressive behaviour in children with ADHD.

Understanding and early identifying the risk factors involved in triggering disruptive behaviour in children with ADHD should be one of the main goals in preventive strategies for comorbid conditions, aggressive behaviour and failures in social relationships and academic performance.

The most efficient intervention is based on a multimodal approach which involves medical, psychosocial and educational strategies considering familial, environmental and biological risk factors associated with behavioural problems in children with ADHD.

**Key words:** ADHD, verbal and physical aggressive behaviour, auto-aggressive behaviour

**REZUMAT**

Prezența ADHD la copii este un factor de risc semnificativ pentru dezvoltarea tulburărilor de comportament (TC), comportament agresiv cronic și comportamentul antisocial. Studiile au arătat că un comportament agresiv are o prevalență ridicată și este unul dintre cele mai dificile
Simptome ale ADHD de tratat la copiii și adolescenții care au nevoie de evaluare psihiatrică și de intervenție.

Lucrarea noastră a analizat factorii demografici, socio-economice și clinici referitori la un anumit model de comportament agresiv: comportament hetero-agresiv (verbal și fizic), sau comportament auto-agresiv la copii ADHD.

**Material clinic și metoda**

Am analizat factorii de risc prenatale, istoricul medical familial, etapele de dezvoltare, mediul social și familial, performanțele școlare, relationarea socială și corelarea lor cu un anumit tip de comportament agresiv și de severitatea simptomelor într-un eșantion clinic de 124 de pacienți, în vârstă de 5 la 14 ani. Toți pacienții au avut diagnosticul pozitiv de ADHD bazat pe criteriile DSM-IV pentru ADHD. Evaluarea a inclus evaluarea psihiatrică completa și evaluarea clinică, copil și părinți interviu, Child Behaviour Checklist pentru varstele 6-18, Stony Brook inventar (versiunea pentru parinti) și Disruptive Behaviour Assessment Scale (versiunea pentru parinti si profesor).

Nu am considerat eligibili pentru studiu copii cu IQ <50 și cu afecțiuni severe neurologice și somatice comorbidă.

Datele au fost prelucrate statistic utilizând A-NOVA și testul chi-pătrat pentru variabile calitative.

Pentru factorii socio-demografici am utilizat statistica descriptive.

**Rezultate**

Comportamentul fizic agresiv a fost corelat semnificativ statistic (p <0,05) cu factorii socio-economici (p = 0,047), mediul familial și emoțional abilităților parentale (p = 0, 038), probleme de comportament și relationare deficitara (p = 0, 0005) și severitatea simptomelor ADHD (p = 0, 007). Comportament verbal agresiv a fost semnificativ corelat (valoare p <0,05), cu performanțe educaționale (p = 0, 004), probleme de comportament și relationare deficitara (p = 0). Am constatat, de asemenea o corelație semnificativă statistic între comportament auto-agresiv și mediul emoțional familial precum și cu abilităților parentale (p = 0, 0046), factorii socio-economici (p = 0,032) și nivelul educațional al părinților (p = 0, 0002).

Nu au existat corelații semnificative statistic între comportamentul hetero-agresiv (verbal și fizic) sau auto-agresiv și cu factorii corelați cu sarcina și nașterea, istoricul medical familial, boli psihiatrice sau somatice sau severitatea simptomelor ADHD.
Concluzii
Rezultatele noastre sugerează ca factorii familiari (funcționarea familiei, nivelul de educație, statutul socio-economic, aptitudinile parentale), joacă un rol important în dezvoltarea atât a comportamentului agresiv fizic cat și al celui autoagresiv la copii cu ADHD.
Înțelegerea și identificarea precoce a factorilor de risc implicați în declansarea comportamentului deviant la copii ADHD ar trebui să fie unul din obiectivele principale ale strategiilor de prevenire a tulburărilor comorbide, comportamentului agresiv și eșecurilor în relaționarea socială si a performanțelor academice.
Cea mai eficienta intervenție se bazează pe o abordare multimodală, care implică strategii medicale, psihosociale și educaționale luând în considerare factori de risc familiari, de mediu și biologici asociati cu probleme de comportament la copii ADHD.

Cuvinte cheie: ADHD, comportamentul verbal și fizic agresiv, comportament auto-agresiv

INTRODUCTION

Most of the child's behavioural characteristics develop during the first years of life. Thus, exposure to certain risk factors and early social experiences influence the likelihood of dysfunctional behaviours that predispose to aggression and delinquency even from early years. The individual risk factors (family psychiatric disorders, pre- and post-natal disturbing factors) and environmental factors play an important role in a child's ability to regulate his emotions and attention level.

Aggressiveness is a complex behaviour with multiple causes that includes along with biological and temperamental factors, many other social factors, represented by abusive and tense family relationships, dominated by numerous conflicts, violence, inconsistent educational rules, physical abuse, emotional deprivation, excessive, harsh and disproportionate child punishment.

The presence of ADHD in children is a significant risk factor for the development of conduct disorder (TC), chronic aggressive behaviour and antisocial behaviour. Studies have shown that aggressive behaviour has a high prevalence and is one of the most difficult to treat ADHD symptoms in children and adolescents who require psychiatric evaluation and intervention.
PURPOSE

Our paper examined the demographical, socioeconomic and clinical factors related to a specific pattern of aggressive behaviour: hetero-aggressive behaviour (verbal and physical) or auto-aggressive behaviour in children with ADHD.

CLINICAL MATERIAL AND METHOD

We analyzed prenatal risk factors, family medical history, developmental milestones, social and familial environment, school performance, peer relationship and their correlation with a certain type of aggressive behaviour and symptoms severity in a clinical sample of 124 patients, aged 5 to 14 years.

All the patients had a positive diagnosis of ADHD based on DSM-IV criteria for ADHD. Their assessment included:

- Complete psychiatric and clinical evaluation,
- Direct child and parents interview – in order to obtain sociodemographic data, personal and familial medical history, school functioning, academic performance and peer relationship
- Child Behaviour Checklist for ages 6-18
- Stony Brook inventory (parent version)
- Disruptive Behaviour Assessment Scale (parent and teacher version).

We didn’t consider as eligible individuals with IQ < 50 and severe somatic or neurological comorbidities.

Data were statistically processed performing Chi-Square test for qualitative variables.

Descriptive statistics were performed for socio-demographic factors.

RESULTS

a) Descriptive statistics
The clinical sample consisted of 124 patients, with a sex distribution of 102 boys (82.26\%) and 22 girls (17.74\%).

The average age of the patients was 8.79 (age range 5 to 14 years) with a standard deviation of 2.939.

83.06\% of the patients were living in a city and 16.93\% were from the countryside.

We also took into account the number of hospital admissions over 2 years follow-up - 6.94\% of the patients had no hospital admissions, 58.87\% had 1 hospital admission, 21.77\% had 2 admissions, 1.61\% had 3 hospital admissions and only 0.81\% had 4 hospital admissions for their aggressive behaviour and ADHD symptoms.

69.35\% of all the children had a stable family environment, meaning that they were raised by both their parents in an organized family, 20.97\% of children had only one parent (family disorganization by divorce, death of one parent, parental separation) and 9.68\% of children were institutionalized (abandoned children or living in foster care).

Analyzing the data about personal history (pregnancy, delivery and birth circumstances) we found that 19.20\% of patients had a positive history of severe birth injury (Apgar score < 8), 16\% had mild birth injury and 0.80\% of them had pregnancy disturbances (bleeding or painful contractions during pregnancy, threatened abortion) and 59.2\% had normal birth and pregnancy outcome.

We also found that 16.13\% of patients showed verbal aggressive behaviour with their peers, 20.97\% with their family members, 3.23\% with their teachers and 46.77\% manifested verbal aggressive behaviour with all those persons. Only 12.90\% had no verbal aggressive behaviour.
44.35% of our studied patients had physical aggressive behaviour with their peers, 4.03% were found to be physical aggressive with their family members, 4.03% were bullying and 9.68% were physical aggressive both with their peers and with their family members.
Fig. 2. Physical heteroaggressive behaviour

Most of the patients (95.16%) in our sample had no self-aggressive behaviour. Only 4.03% of patients had important self-aggressive behaviour and 0.81% manifested self-harmful behaviour only occasionally.

b) Statistically significant correlations between the studied factors

Physical aggressive behaviour was statistically significant (p-value = 0.038) correlated with family emotional environment (stability of the family life, harmony in their family relationships, strains and tensions between parents, numerous conflicts) and parenting skills (neglecting and abusive parents or overprotective and highly controlling parents).

Fig. 3. Correlations between physical aggressive behaviour and family relations
Correlations between physical aggressive behaviour and behavioural problems/peer relationships (children with mild/moderate or severe adaptation and conduct problems in school, negativistic attitude, provocative opposition, frequent physical conflicts with their peers or school refusal) were also statistically significant (p= 0.00005).

![CORRELATIONS BETWEEN PHYSICAL AGGRESSIVITY AND BEHAVIORAL PROBLEMS IN SCHOOL](image)

Fig. 4. Correlations between physical aggressiveness and behavioural problems in school

The severity of ADHD symptoms measured in number of hospitalizations during 2 years follow-up was also statistically significant correlated (p= 0.007) with our patients physical aggressive behaviour.
Fig. 5. Correlations between physical aggressiveness and ADHD severity

Verbal aggressive behaviour was well correlated (p-value < 0.05) with educational performance measured by school grades (p= 0.004) and also with behavioural problems and peer relationship (p= 0).
Fig. 6. Correlations between verbal aggressiveness and school performance

Fig. 7. Correlations between verbal aggressive behaviour and school behaviour
We also found statistically significant correlations between auto-aggressive behaviour and family emotional environment and parenting skills (p= 0.0046), socioeconomic factors (p= 0.032) and educational level of parents (p= 0.0002).

There were no statistically significant correlations between hetero-aggressive (verbal and physical) or auto-aggressive behaviour and factors related to pregnancy and birth circumstances, family medical history of somatic or psychiatric illnesses and severity of ADHD symptoms.

**DISCUSSION. CONCLUSIONS**

- Our findings suggest that familial factors (family functioning, educational level, socioeconomic status, parenting skills) play an important role in the development of physical, verbal and auto-aggressive behaviour in children with ADHD.
- Physical aggressive behaviour seems to be related to the severity of ADHD symptoms expressed by the number of hospital admissions for behavioural problems related to impulsivity and hyperactivity.
- School performance is also an important factor correlated with verbal aggressive behaviour.
- Patients with generalized hetero-aggressive behaviour (with peers, family members and teachers) seem to have a higher risk to develop a conduct disorder.
- Understanding and early identifying the risk factors involved in triggering disruptive behaviour in Children with ADHD should be one of the main goals in preventive strategies for comorbid conditions, aggressive behaviour and failures in social relationships and academic performance.
- The most efficient intervention is based on a multimodal approach which involves medical, psychosocial and educational strategies considering familial, environmental and biological risk factors associated with behavioural problems in children with ADHD.