

Aggressive behaviour and impulsiveness. Mutual relationship.

Aggressività e impulsività: due diverse dimensioni in reciproca relazione.

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RIASSUNTO

Da una revisione della letteratura emerge che l'impulsività e l'aggressività sono presenti in numerose categorie diagnostiche, tanto che possono essere considerate dimensioni transnosografiche. Pochi Autori, però, hanno approfondito il tipo di rapporto esistente tra tali fenomeni, giungendo spesso a conclusioni divergenti, qualora venga indagato.

Scopo del presente studio è quindi quello di indagare se esiste una relazione tra queste due dimensioni, e nel caso in cui esista, che tipo di relazione è e se è ubiquitaria o varia a seconda del contesto clinico in cui andiamo a studiare il fenomeno.

A tale scopo abbiamo reclutato un campione di 124 pazienti ai quali abbiamo somministrato:

la Mini International Neuropsychiatryc Interview (M.I.N.I.) per porre diagnosi secondo i criteri del DSM-IV-TR., la Inventory for Assessing Different Kinds of Hostility (QTA) e la Barratt Impulsiveness Scale-11 (BIS-11) rispettivamente per la valutazione dell'aggressività e dell'impulsività.

Dalle analisi statistiche emerge una correlazione positiva e significativa tra aggressività ed impulsività nell'intero campione ($p=0,001$); questo rapporto, però, non si mantiene tale in ciascuna categoria diagnostica presa singolarmente, come avviene, per esempio, nel Disturbo Bipolare, nella Dipendenza da Alcool e nel Disturbo Borderline di Personalità. In generale, quindi, tra aggressività ed impulsività esistono stretti rapporti, ciò non significa che possano essere usate indifferentemente per definire lo stesso tipo di comportamenti; anzi in alcuni specifici disturbi sembrano essere due dimensioni indipendenti, non del tutto sovrapponibili. A conferma dell'autonomia di tali fenomeni c'è anche il fatto che solo alcuni sottotipi di impulsività sono in grado di predire i livelli di aggressività espressa e viceversa.

Parole chiave:

aggressività, impulsività, transnosografia.

SUMMARY

Aggressiveness and impulsiveness are found in various diagnostic categories, so they look transnosographic dimensions, but few Authors have studied which kind of relationship exists between these two phenomenon obtaining often divergent conclusions.

The aim of this study is to verify if a relationship exists between these two dimensions, and if so, what kind: is it ubiquitous or does it according to the clinical context in which the phenomenon is studied?

We studied a sample of 124 patients and we administered 3 specific questionnaires to each one: the Mini International Neuropsychiatric Interview (M.I.N.I.) for diagnosis according to DSM.IV.TR criteria, the Inventory for Assessing Different Kinds of Hostility (QTA) for the evaluation of aggressiveness, and the Barratt Impulsiveness Scale Version 11 (BIS-11) for the evaluation of impulsiveness.

By statistical analysis a significant, positive correlation results between aggressiveness and impulsiveness in the whole sample ($p=0,001$), but this relationship does not remain as such in each diagnostic category taken individually, as happen, for example, in the Bipolar Disorder, Alcohol Dependence and Borderline Personality Disorder: in patients affected by these disorders we didn't find a significant correlation between aggressiveness and impulsiveness.

In general, there is a close relationship between aggressiveness and impulsiveness; this does not imply that these terms can be used to define the same type of behaviour. On the contrary, in some specific contexts they seem to be two independent spheres which are not completely overlapping. Confirming this is the fact that only some of subdimensions of impulsiveness are capable of predicting the expression of aggressiveness and vice versa.

Key words:

Impulsiveness, aggressive behaviour, transnosography

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Introduction

By now it is common knowledge and generally agreed upon that the spheres of aggressiveness and impulsiveness are largely overlapping, to the extent that the words “aggressiveness” and “impulsiveness” are often used interchangeably both in current use and in clinical practice, creating a considerable amount of terminological confusion. This is confirmed by the definition of aggressiveness in research in which concepts such as “violence, agitation and impulsiveness” are found (Nardini et al., 2000). When referring to suicidal acts several Authors sometimes identify them as impulsive acts, other times as aggressive ones, without taking into account the distinction between these two phenomena. Some recent studies even propose both phenomena as a unit, condensing them into names such as “impulsive aggressiveness”, “aggressive impulses” or “impulsive-aggressive behavior”.

In fact, these two dimensions seem to overlap not only terminologically, but also as far as their implicated biological aspects and some clinical symptoms are concerned. On a neurobiological level, a major decrease in serotonergic tone and an increase in catecholamine has been noted in both aggressive and impulsive behavior, while both appear to be transnosographic phenomena from a clinical point of view since they can be found in everyday life in patients with different diagnoses. It is no accident that aggressiveness does not make up the organization center of any of the disorders mentioned in the DSM, and impulsiveness only confers unity to the chapter regarding impulse loss of control, a category which is somewhat debatable. In addition, aggressiveness is often found where impulsiveness is found when the various disorders - depression (Koukopoulos et al, 1992, Rutz et al, 1999), obsessive-compulsive disorder (Hantouche et al, 1997, Hand 1995), and bipolar disorder (Swann et al, 2001, Double, 1990) - are taken on an individual basis, thereby creating a sensation of further confusion and overlapping of the two phenomena.

At the current time, there is no specific treatment – not even a pharmacological one - which is selective in regards to one of these two dimensions, if not depending on the categorical disorder in which it compares with molecules that “treat” one, when it works in the other. On the other hand, considering the availability of different molecules endowed with a potential therapeutic effect towards these symptoms, it would be desirable to understand the limits and trace some guidelines for their treatment, in a kind of “pharmacological dissection”

which would be useful on a clinical-practical level and in better defining their differential characteristics. Therefore, it is essential to describe aggressiveness and impulsiveness in a less ambiguous way and to define their limits more precisely, favoring the view that considers the two phenomena autonomous, fundamentally separate symptoms which can be correlated with each other even if they are independent from each other.

A few, more precise definitions than those mentioned before bring to light some distinctions concerning both spheres. In the field of psychology, when referring to impulse or impulsiveness, we tend to emphasize the speed with which the behavior – be it motor, mental, or verbal – occurs, and the fact that such behavior is sustained by irrationality, that is, lacking in adequate cognitive reflection. As far back as 1905, Freud asserted that impulse is “an act or stimulus that arises without a rational reason and is carried out quickly, sometimes violently, revealing a clouding of the conscience or a disorder of the will marked by a very intense emotional state”. Subsequently, in 1938, Murray defined impulsiveness as “an immediate reaction to a stimulus dictated by circumstance, risk-taking in order to obtain certain things as quickly as possible”. In the more recent past, impulse seemed to derive from a need originating from the loss of homeostatic balance, and according to Muller (1980) “it receives a thrust towards fulfillment from intention”.

The word aggressiveness, on the other hand, which literally means “to go toward” (*ad-gradior*) is an attitude which is defined based on values towards others. In everyday use it is often associated with hostile, destructive tendencies with harmful intentions towards others and does not seem to be characterized by the speed of action, impetuosity, or by the omission of cognitive rectification. Aggressiveness is an aspect of one’s character or behavior that takes shape in excited or violent manifestations (Devoto Oli, 1995). On the contrary, according to Freud, impulsive acts are only violent at times, and continuing in Freud’s and Adler’s psychoanalytical vein, the term aggressiveness is once again synonymous of drive, defined by the authors as “a dynamic process, a drive that makes the organism aim towards a certain goal”.

Currently there are three aspects that allow us to define an act as aggressive: intention, which represents the desire to create damage, action, aimed towards causing physical damage with or without verbal aggression, and the emotional state; if anger is not present with aggressiveness, it is known as instrumental or “cold” aggressiveness (Maremmani et al, 1999). In addition, if we analyze these two phenomena in detail, in reality they appear particularly multifaceted and complex, each one being made up of numerous components.

On this subject, Barratt (1997) proposes a subtype of impulsive behavior hypothesizing a motor impulsiveness where there is a tendency to act without preventative reflection, an attentional impulsiveness (which does not necessarily translate into action) intended as the tendency to make rapid decisions, and, lastly, a non-planning

impulsiveness which is perhaps the most general one and includes the previous two aspects, which is defined as a superficial evaluation of the consequences of a choice or action. We feel that this last subtype, together with the rapidity of the action, represents the essence of impulsiveness. On the other hand, as far as aggressiveness is concerned, Buss and Durkee (1957) define several ways of harming others directly or indirectly, verbally through displays of intolerance, reaching stages of destructive tendency of a virtual kind where it is not acted upon but experienced on an emotional, internal level (irritability, negativism, or suspicion).

Aggressiveness and impulsiveness have been thoroughly discussed in literature, though those studies which have more deeply researched the type of relationship that exists between these two dimensions are few and often reach differing conclusions. On one hand, some studies assign a leading role to impulsiveness, suggesting that aggressive behavior is probably brought on by an impulsive drive, and even in animals a greater expression of aggressiveness seems to be associated with impulsiveness: it is probably correct, therefore, to assume that aggressiveness and impulsiveness are subtended by a biological-structural unitary nucleus that could translate into a common reduction of the functionality of the serotonergic system on a neurochemical level (Lesch et al, 2000; Sietse et al, 2003). Some researchers have emphasized, on the contrary, that self-directed aggressive conduct does not necessarily have to be secondary to a lack of impulse control and therefore such types of behavior should not be considered an indication of impulsiveness (Herpertz S., 1995).

Continuing along such lines of thought and following the hypothesis that aggressiveness and impulsiveness, which almost appear to be overlapping upon superficial analysis, are probably two independent phenomena, we have attempted to verify if a relationship exists between these two dimensions, and if so, what kind: is it ubiquitous or does it vary according to the clinical context and diagnostic category in which the phenomenon is studied?

Instruments and method

We studied a sample of 124 patients admitted to the University of Siena Psychiatric Hospital, made up of 52% of female subjects and 48% male subjects, with an average age of 44 ± 16.39 years. Included in the sample were patients with Axis I and II diagnosis according to the criteria of the DSM IVTR, divided into the following categories: panic disorder (20%), obsessive-compulsive disorder (9%), major depressive disorder (32%), bipolar disorder (17%), alcohol dependency (10%) and borderline personality disorder (12%).

We administered three specific questionnaires to each patient: the Mini International Neuropsychiatric Interview (M.I.N.I.) for diagnosis according to DSM. IV.TR criteria, the Inventory for Assessing Different Kinds of

Hostility (QTA) for the evaluation of aggressiveness, and the Barratt Impulsiveness Scale-Version 11 (BIS-11) for the evaluation of impulsiveness.

The QTA is a self-administered test composed of 75 items outlining a profile of aggressive behavior further classified in eight different types of conduct: direct aggressiveness (behavior aimed towards harming others), indirect aggressiveness (behavior such as belittling, hurling objects, playing jokes in bad taste), irritability (intolerance and impatience towards others), negativism (opposing behavior such as breaking rules, refusal of duties, doing the opposite of what is requested), resentment (sensation of having been treated unfairly, lack of satisfaction regarding one's present and past), suspicion (conviction of being belittled, mistrust), verbal aggression (constant arguing with others, saying unpleasant things, raising one's voice), guilt (supported by a strong sense of duty and a rigid moral conscience). Total score range from 0 to 75.

The BIS-11 scale, also self-administered, is composed of 30 questions; the items are divided into three domains: "attentional impulsiveness", "motor impulsiveness" and "non-planning impulsiveness". The total BIS-11 score, with a range from 30 to 120, is obtained from the sum of these three field scores. The time span explored is the patient's entire life, since the scale evaluates impulsiveness as a personality trait. Average scores found in research literature are: 63.8 \pm 10.2 in control subjects, 69.3 \pm 10.3 in subjects with abuse behavior, 71.4 \pm 12.6 in psychiatric patients and 76.3 \pm 11.9 in male convicts (L.Conti, 1999).

The data obtained was processed by statistical analysis using SPSS (Statistical Package for Social Sciences) software, version 11.0.1 for Windows (SPSS inc 2002).

Results

From a purely descriptive point of view, our sample resulted in an average score of 42.53 \pm 10.63, in a range from 0 to 75 in the aggressiveness scale and an average of 67.15 \pm 9.46 with a range from 30 to 120 on the impulsiveness test. In addition, the total scores of the BIS-11 and QTA were overlapping in the various diagnostic categories, without a visible difference between the various groups under examination (Fig. 1). Aggressiveness and impulsiveness, in fact, appear to be distributed in a uniform Gaussian curve without specific peaks, much more similar to that of physiological rather than pathological phenomena. A slight prevalence of aggressive and impulsive values can only be noted in personality borderline disorder, and aggressive values in alcohol dependency, compared to other disorders. In any case, univariate analysis of the variance (ANOVA) has not revealed significant statistics regarding such differences for either the total QTA score or the BIS-11 score.

When analyzing the relationship between aggressiveness and impulsiveness utilizing bivariate linear correlation, a significant, positive correlation between the QTA total score and the BIS-11 total score ($r=0.47$; $p<0.001$) was revealed. However, when observing the position taken on by each patient in the dispersion chart in the sample that we examined, we discovered that there are individuals that have low QTA scores but high impulsiveness levels in the BIS-11 and vice versa, those with a low impulsiveness score that display major aggressive behavior (Fig. 2). Aggressiveness and impulsiveness, therefore, seem to be two phenomena that are closely correlated but certainly not completely overlapping.

After having divided the sample according to the different diagnostic groups, the abovementioned correlation was significant in obsessive-compulsive disorder ($r=0.83$; $p=0.01$), in panic disorder ($r=0.44$; $p=0.04$) and in major depressive disorder ($r=0.68$; $p<0.001$). On the other hand, there was not a significant correlation in bipolar disorder, borderline personality disorder or in alcohol dependency (Tab.1). Most likely, in these two categories aggressiveness and impulsiveness are two autonomous psychopathological centers, probably sustained by neurochemical substrata and by different causes, considering that each dimension can be present or absent independently from the other. On the contrary, in obsessive-compulsive disorder, panic disorder, and in major depressive disorder, aggressiveness is present if impulsiveness is present, and vice versa. In addition, as far as obsessive-compulsive disorder is concerned, the correlation between aggressiveness and impulsiveness is not only significant but is also quantitatively high and very pronounced, more so than for any other group under examination, as though two overlapping phenomena are really being dealt with in this specific pathology.

To explain in further detail, carrying out multiple regression by placing the impulsiveness subgroups as independent variables and the total score of aggressiveness as a dependent variable, positive, significant correlations were found between aggressiveness and the three dimensions of impulsiveness taken all together ($R^2=0.27$; $p<0.001$) and between aggressiveness and the subtypes of motor impulsiveness ($\beta=0.34$; $p<0.001$) and non-planning impulsiveness ($\beta=0.31$; $p=0.007$) taken individually (Tab.2). There was no significant correlation, on the other hand, with the subtype of attentional impulsiveness. Therefore we can stress that the sum of the domains of impulsiveness make up a predictive model of the aggressiveness levels expressed. In particular, motor and non-planning impulsiveness, more so than attentional impulsiveness, determine the display of aggressive behavior.

Carrying out the same type of processing after having placed the total score of the BIS-11 as a dependent variable and the subdimensions of the QTA as independent predictors, statistically significant correlations between aggressiveness subtypes taken altogether and impulsiveness resulted ($r^2=0.26$; $p=.001$), as well as

between impulsiveness and the subfield of irritability ($\beta=0.25$; $p=0.05$) (Tab.3). In this case, therefore, aggressiveness in the generic and global sense constitutes a predictive model capable of explaining impulsiveness levels. However, taking apart its multiple facets and studying the individual subdimensions of aggressiveness, none of these alone can predict the amount of impulsiveness except irritability, the only one that demonstrates a significant, partial correlation, though quantitatively small, with the impulsiveness levels expressed.

.Conclusions

In the first place, the data obtained confirm that aggressiveness and impulsiveness are transnosographic dimensions. On a strictly clinical level, we certainly agree that aggressiveness and impulsiveness are very different in various psychopathological pictures, especially as far as the quality of the phenomena under examination are concerned; anger, main affliction exclusive to borderline disorder, is very different from the restrained, inhibited resentment of the depressed patient, the pantoclastic violence of the schizophrenic, the explosiveness of the obsessive and the afinalistic aggressiveness of the alcoholic. In reality, when carrying out a purely quantitative comparison between diagnostic groups evaluated with psychometric instruments, substantial differences do not emerge. The entity of the aggressive values measured with the QTA in our sample is more or less equivalent in all disorders and analysis of the variance has not brought out statistic significance of the differences, even though there is a slight prevalence regarding borderline personality disorder or alcohol dependency which is often correlated with personality disorder. The same is true for impulsiveness, evaluated with the BIS-11; once again, a slight, though not significant prevalence is noted in borderline patients. In conclusion, aggressiveness and impulsiveness seem to be ubiquitous phenomena, detectable with the methodology available in every clinical context. With the instruments that we used, it is probably not easy to perceive the most subtle qualitative differences which are pertinent to the psychopathological descriptions or everyday experience of the clinic.

In the second place, in the sample under examination we can see that the two dimensions are correlated according to a correlation coefficient which is not very high in absolute value, but certainly significant. The dispersion of the patients is also relatively uniform and in sequence with the line of regression. Therefore, in general there is a close relationship between aggressiveness and impulsiveness; this does not imply that one label is the same as another, that these terms can be used to define the same type of behavior, or that they are interchangeable. On the contrary, aggressiveness and impulsiveness seem to be two independent dimensions which are not completely overlapping. Confirming this, in fact, are those patients in our sample who diverge

from the line of regression and display low levels of aggressiveness with a high level of impulsiveness or vice versa.

The fact that the correlation between the two phenomena – though significant in the whole sample – does not remain as such in each diagnostic category taken individually proves this. Surprisingly, the relationships between aggressiveness and impulsiveness are lacking in statistic significance in borderline disorder, alcohol dependency, and bipolar disorder, as though in these specific pathologies the two phenomena are independent, distinct, without relative points of contact.

On the other hand, in panic disorder, obsessive-compulsive disorder, and major depressive disorder the relationship between the two dimensions remains statistically important, varying only in the absolute value with a maximum peak in obsessive patients and minimum in patients affected by panic disorder. To sum it up, therefore, the correlation that exists between aggressiveness and impulsiveness is not ubiquitous, but varies from one clinical context to another.

In light of the analysis of the data previously illustrated and the information reported in literature, various questions arise. For example, we wondered if there is a chance relationship between the two phenomena, and we tried to verify if one of the two aspects is primary over the other.

Motor impulsiveness and non-planning impulsiveness seem to be capable of determining and predicting the expression of aggressiveness; among the numerous subdimensions of aggressiveness only irritability constitutes a predictive model of the amount of total impulsiveness. Most likely this justifies, first of all, the fact that impulsiveness and aggressiveness are two correlated phenomena, but independent considering that only some subtypes of one predict the other, and vice versa. In addition, this could explain how in borderline personality disorder, alcohol dependency, and bipolar disorder the two dimensions remain autonomous, as though all subtypes of both dimensions were present in these disorders and not in the others; this could result in the absence of correlation between aggressiveness and impulsiveness.

The issue is, in any case, a very complex one and leaves us with numerous doubts and unanswered questions. It would be interesting to extend the sample and carry out further study, including research to discover if one of the two dimensions is foregoing, primary in relationship to the other.

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