



## Original article

# Impulsivity in early psychosis: A complex link with violent behaviour and a target for intervention



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## ABSTRACT

**Background:** Violent behaviour (VB) occurs in first episode of schizophrenia and can have devastating impact both on victims and patients themselves. A better knowledge of the underlying mechanisms of VB may pave the way to preventive treatments.

**Objectives:** 1) To explore the nature of the link between impulsivity and VB in early psychosis (EP) patients; 2) To explore the interactions between impulsivity and substance abuse, insight, and positive symptoms, the main dynamic risk factors of VB described to date.

**Design and methods:** Post hoc analysis of data acquired in the frame of a 36-months EP cohort study. A total of 265 EP patients, aged 18 to 35, treated at TIPP (Treatment and early Intervention in Psychosis Program), at the Department of Psychiatry in Lausanne, Switzerland, were included in the study. Logistic regression analyzes were performed as well as mediation analysis and interaction analysis

**Results:** Our data suggest that impulsivity is a predictor of VB when analyzed independently and as part of a multi-factorial model. Impulsivity continues to differentiate violent patients from non-violent ones at the end of the program. In addition, the relationship between impulsivity and VB is not mediated by substance abuse. Finally, the effect of impulsivity on the probability of VB is potentiated by the interaction of different levels of insight and positive symptoms.

**Conclusions:** Early intervention strategies in psychotic disorders should include evaluation of impulsivity considering it is linked to increased risk of VB and may respond to treatment.

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## 1. Introduction

Impulsivity which is a major risk factor of violent behaviour (VB) [1–3] in the general population of violent aggressors [4], has

become a focus of interest in forensic psychiatry, since as a “dynamic risk factor” (along with substance abuse), it is susceptible to change and could be influenced by therapeutic interventions, contrary to “static risk factors” (such as gender or past aggression) which cannot be modified.

Recent studies have explored impulsivity in schizophrenia and confirmed that its presence is associated with an increased risk of VB [5–7]. However, while the risk of VB is high in the early phase of psychosis [5,6], and although various authors have suggested that impulsivity could play a major role in this issue, studies on this topic are rather rare despite their potential usefulness in adapting treatment and developing preventive strategies [1,7–9].

The study of the nature of the links between impulsivity and VB has yielded contradicting results, some studies supporting a direct

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relationship while others suggested this link would be indirect [10]. Indeed, some data [11,12], including a meta-regression analysis of dynamic risk factors [7], suggest impulsivity is directly linked to VB, while other authors, considering the high levels of impulsivity in people with substance use disorder (SUD), have proposed that this link may actually be indirect [13] and mediated by SUD [14]. However, the study of this relationship is blurred by high rates of comorbid SUD and high prevalence of comorbid antisocial personality disorders in patients displaying VB [10,11,15–17] and the number of other factors which may mediate this link. These variations regarding the nature of the link between impulsivity and VB may also be explained by some degree of heterogeneity regarding number of risk factors displayed by each individual patient [15,18–20]. Although these studies demonstrated an elevated level of impulsivity with occurrence of violence in a subgroup of patients, they didn't clearly establish a link between VB and impulsivity. These conflicting results may also reflect a conceptual problem: if there is a general consensus regarding the definition on impulsivity which could be described as “a predisposition towards rapid, unplanned reactions to internal or external stimuli without regard to the negative consequences of these reactions to the impulsive individual or to others” [21], impulsivity is also considered as a multidimensional concept [16,22–24] and is assessed differently depending on the author. Finally, the fact that impulsivity can be investigated either as a *personality trait* or as a *personality state* which can vary according to pathology [13,14] or situational factors, also contributes to the inconsistencies between studies.

In an attempt to disentangle these issues and considering the fact that a better knowledge about the link between impulsivity and VB in EP patients may pave the way towards the development of preventive and therapeutic strategies [25,26], we planned this study in a prospective cohort of EP patients in order to answer the following questions: (1) is there a link between dynamic factors and VB? (2) Is the nature of the link between impulsivity and VB direct or indirect (mediated by other factors)? (3) Do various dynamic risk factors interact with impulsivity with regards to VB? (4) How does impulsivity evolve over the follow-up?

## 2. Patients and methods

### 2.1. Procedure and participants

The patients included in this study stem from a cohort of patients treated at the *Treatment and early Intervention in Psychosis Program (TIPP)*, a specialized early psychosis program launched in 2004 at the Department of Psychiatry CHUV, Lausanne, Switzerland [27,28]. Entry criteria to the program are: (i) age 18–35; (ii) residence in the catchment area; (iii) meeting threshold criteria for psychosis, as defined by the ‘Psychosis threshold’ subscale of the Comprehensive Assessment of At Risk Mental States scale [29]. Exclusion criteria are (i) antipsychotic medication for more than a total of 6 months, (ii) psychosis related to intoxication or organic brain disease, or (iii) an intelligence quotient <70. The local Research and Ethics Committee granted access to the clinical data for research purposes.

A specially designed questionnaire is completed for all patients enrolled in the program by case managers (CMs) who have up to one hundred contacts with patients during the three years of treatment. It allows assessment of demographic characteristics, past medical history, history of VB, penal status, past treatment in forensic psychiatry, exposure to life events as well as symptoms and functioning. It is completed on the basis of information gathered from patients and their family over the first weeks of treatment and can be updated during follow up if new information emerges. Follow-up assessments exploring various aspects of treatment and co-morbidities as well as evolution of psychopathology and

functional level are conducted, after 2, 6, 12, 18, 24, 30 and 36 months in treatment by trained psychologists for scale based assessment of psychopathology and by case managers for descriptive measures such as employment for example. Psychopathology was assessed on the basis of PANSS with good inter-rater reliability between psychologists.

At the time of the study, 265 patients had been followed-up prospectively over 36 months.

### 2.2. Violent behaviour

Definition: VB have been defined as “serious violence” i.e “assault causing any degree of injury, any use of a weapon or any sexual assault. The term any was used when the severity of the violence was not specified” [8].

Assessment of VB: Episodes of VB were identified in three distinct ways. Firstly, by CMs on the basis of a questionnaire completed for all patients, in the frame of the clinical interactions occurring between them and patients over the entire 36 month treatment period (averaging 100 contacts per patient). This questionnaire allows the recording of any violent offense and behaviour (such as assault and battery, threats with a weapon, . . . ). A meta-analysis by Winsper et al. [30] established the good reliability and validity in the self-reporting of serious aggressions. Secondly, CMs gathered additional information through contact with parents, significant others and the forensic psychiatric services (hetero-reporting of aggression). Finally, episodes of VB occurring during the treatment phase were identified on the basis of the Staff Observation Aggression Scale [SOAS-R scale [31], which lists all critical events related to a VB during hospitalisations. Patients were considered as having displayed VB whether or not they had been brought to court.

The patients were stratified in 2 groups: as (a) “violent patients”(VP) and (b) “non-violent patients”(NVP) on the basis of the previous definition. Patients of the VP group had committed physical aggression against people at least once. NVP were patients who had not committed any violent actions. Considering that patients who had committed crimes which did not involve harm to people (examples: theft, drug trafficking) may nevertheless not be considered as completely non violent, they were excluded from the NVP group and were therefore not included in the analysis.

In addition, the VP group was considered in 2 complementary ways. Firstly, we looked at the whole sample of VP (N=72), composed of any patient who had committed at least one physical aggression, regardless of its time of occurrence (before entering to the program and/or during the program). Secondly, in order to explore the impact of characteristics recorded at entry to the program on the later occurrence of VB, we restricted the analysis patients who displayed violent behaviour exclusively during the treatment phase (N = 62) and compared them to NVP. The objective of these analyses was to explore whether impulsivity has an impact on subsequent VB. In addition, considering the fact that acts committed before the program may not necessarily have been related to psychosis, since they may have occurred before the first episode of psychosis, we decided to exclude these 10 patients from the analyses.

### 2.3. Dynamic factors assessed at the program entry with a potential impact on VB

On the basis of existing literature we considered the following characteristics as potential dynamic factors related to VB: Substance Use Disorder SUD (alcohol, marijuana and other substances) [32–34], presence of positive psychotic symptoms [35], lack of insight [36–40], and impulsivity.

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