Psychiatry Research 247 (2017) 336–344

Contents lists available at ScienceDirect

Psychiatry Research

journal homepage: www.elsevier.com/locate/psychres

Utility of risk-status for predicting psychosis and related outcomes: evaluation of a 10-year cohort of presenters to a specialised early psychosis community mental health service

Agatha M. Conrad[a,*], Terry J. Lewin[a,b,**], Ketrina A. Sly[a], Ulrich Schall[a,b,c], Sean A. Halpin[a,c,d], Mick Hunter[a,d], Vaughan J. Carr[b,e,f]

[a] Centre for Brain and Mental Health Research (CBMHR), Hunter New England Mental Health, the University of Newcastle, and Hunter Medical Research Institute (HMRI), Newcastle, NSW, Australia
[b] Schizophrenia Research Institute, Neuroscience Research Australia, Randwick, NSW, Australia
[c] Child and Adolescent Mental Health Services, Hunter New England Mental Health, Newcastle, NSW, Australia
[d] School of Psychology, University of Newcastle, University Drive, Callaghan, NSW, Australia
[e] School of Psychiatry, University of New South Wales, Kensington, NSW, Australia
[f] Department of Psychiatry, School of Clinical Sciences, Monash University, Clayton, VIC, Australia

ARTICLE INFO

Keywords:
Psychotic disorders
Risk-status
Young people
Prediction
Comorbidity
Service outcomes

ABSTRACT

Psychosis transition rates by those at clinical high risk have been highly variable and few studies have compared service presenters across the full psychosis risk spectrum with respect to medium-term outcomes. A 10-year service cohort was examined (N=1997), comprising all presentations to an early psychosis service for young people experiencing a recent psychotic episode or at increased risk ('Psychological Assistance Service', Newcastle, Australia). Baseline and longitudinal service data (median follow-up =7.3 years) were used in a series of logistic regressions to examine relationships between psychosis risk-status and subsequent illness episodes, hospital admissions, and community contacts. Six baseline groups were identified: existing (14.5%) and recent psychosis (19.8%); ultra-high risk (UHR, 9.6%); non-psychotic disorders *without* (35.4%, the reference group) and *with* psychiatric admissions (8.3%); and incomplete assessments (12.5%). High comorbidity levels were reported by the cohort (psychosocial problems, 61.1%; depression, 54.1%; substance misuse, 40.7%). UHR clients experienced similar psychosis transition rates to the reference group (17.3% *vs.* 14.6%; 8.9% *vs.* 9.1% within 2-years) and comparable rates of subsequent non-psychosis outcomes. A 25.9% conversion rate from early psychosis to schizophrenia was detected. However, among transitioning individuals, UHR clients faired relatively better, particularly with respect to changes in comorbidity and mental health contacts. Interventions tailored to current problems, recovery and psychological strengthening may be more appropriate than those based on estimated psychosis risk, which currently lacks clinical utility.

1. Introduction

There has been a recent surge in publications evaluating aspects of 'psychosis risk', including papers examining: *transition* rates and trajectories (Fusar-Poli et al., 2012, 2013; Schultze-Lutter et al., 2015; Simon et al., 2014); *conversion* rates from early psychosis to schizophrenia (Heslin et al., 2015); personalised calculation of psychosis risk (Cannon et al., 2016; Carrión et al., 2016); non-transition and symptom remission (Lin et al., 2015; Simon et al., 2013, 2011); prognostic accuracy and referral source effects (Fusar-Poli et al., 2015a, 2016b; Ruhrmann et al., 2010); early intervention service models and outcomes (Castle and Singh, 2015; Fusar-Poli et al., 2016a; Yung, 2012); and practice recommendations (Schmidt et al., 2015; Schultze-Lutter et al., 2015). The two most common approaches to characterizing psychosis risk utilise the ultra-high risk (UHR) criteria (e.g., Yung et al., 2006) or the basic symptoms (BS) criteria (e.g., Schultze-Lutter et al., 2010), although there is variation in the instruments used (Fusar-Poli et al., 2013; Schultze-Lutter et al., 2015).

* Correspondence to: MH-READ Unit, Centre for Brain and Mental Health Research, Hunter New England Mental Health and the University of Newcastle, PO Box 833, Newcastle, NSW 2300, Australia.
** Corresponding author at: MH-READ Unit, Centre for Brain and Mental Health Research, Hunter New England Mental Health and the University of Newcastle, PO Box 833, Newcastle, NSW 2300, Australia.
E-mail addresses: Agatha.Conrad@hnehealth.nsw.gov.au (A.M. Conrad), Terry.Lewin@hnehealth.nsw.gov.au (T.J. Lewin).

http://dx.doi.org/10.1016/j.psychres.2016.12.005
Received 5 May 2016; Received in revised form 21 November 2016; Accepted 3 December 2016
Available online 05 December 2016
0165-1781/

Early studies reported transition rates above 50% (e.g., Miller et al., 2002), while much lower rates were found subsequently, around 16% within 2-years (Yung et al., 2007, 2008). A recent meta-analysis (27 studies, 2502 individuals) demonstrated that transition rates increased with duration of follow-up (6-months: 17.7%; 1-year: 21.7%; 2-years: 29.1%; and 3-years: 35.8%) (Fusar-Poli et al., 2012). Whilst confirming this pattern, Schultze-Lutter et al. (2015) recommended (for the European Psychiatric Association) that high risk criteria "*... should only be applied in persons already distressed by mental problems and seeking help for them*" and that "*... a trained specialist ... should carry out the assessment*" (Recommendations 4 and 6). Others have also advocated restricting psychosis risk assessment to clients of mental health (MH) services, based on low clinical utility in non-help-seeking samples (Fusar-Poli et al., 2015a).

Another meta-analysis (8 studies, 773 individuals) also found that remission from UHR occurred in 46% over 2-years. On the other hand, many help-seeking individuals assessed as UHR, and who do not transition, nevertheless experience relatively high rates of attenuated psychotic symptoms and non-psychotic disorders at medium-term (2- to 14-year) follow-up (Lin et al., 2015).

Unfortunately, clinical high risk studies often lack appropriate comparison groups. For example, among 118 studies assessed for meta-analysis eligibility, Fusar-Poli et al. (2016b) excluded 97 (82.2%) due to lack of a suitable low risk comparison group with follow-up data. Moreover, despite two decades of UHR research, few service-based studies have directly compared help-seeking individuals at varying levels of psychosis risk. Clearly, given likely variations in illness trajectories and outcomes, it would be advantageous to assess and follow-up service presenters across the full spectrum of risk, including an examination of: transition rates (to psychosis); subsequent (repeated) psychosis episodes; conversion rates (from early psychosis to a schizophrenia diagnosis); and non-psychosis outcomes, including service utilisation patterns. This can probably be most easily achieved by following the *whole cohort of help-seeking individuals* presenting to the targeted mental health service. A prospective application of such a strategy would also be consistent with a broader, recovery-oriented approach to mental health service provision, in which collaborative client-clinician partnerships are encouraged addressing personal and clinical recovery; this includes a concurrent focus on alleviating distress, reducing risk, preventing relapse, and promoting resilience (Commonwealth of Australia, 2013).

1.1. The current study

Previously, we have documented the establishment of a specialised, early psychosis service for young people (Carr et al., 2000) and described the characteristics of service presenters during the first decade of its operation (Conrad et al., 2014). This paper reports the major outcome and prediction findings from an analysis of longitudinal data for clients of this service (covering a median 13-year window). The *primary question* addressed here was whether risk-status assignments at service presentation were *differentially predictive* of subsequent psychosis and non-psychosis outcomes. It was anticipated that, among clients *without* a history of psychosis, those assessed as UHR would have higher transition rates and more intensive service use than those at lower risk. Importantly, we examined comparative outcomes for the whole cohort of service presenters (i.e., across the full psychosis risk spectrum). The group considered to be at the lowest level of risk was non-UHR clients with non-psychosis MH disorders at baseline who had no previous MH inpatient admissions (Group-D1, the 'reference group' in the major analyses).

We also examined associations with baseline comorbidity, time to subsequent psychosis, conversion to a schizophrenia diagnosis for clients with early psychosis, and overall patterns of service use. An added benefit of evaluating medium-term outcomes for service-presenters *with* a baseline history of psychosis is that it facilitates a better characterisation of overall illness, comorbidity, recovery and service trajectories, including *conversion* from first episode psychosis of no diagnostic specificity to a schizophrenia diagnosis, and the proportions not experiencing further episodes or hospital admissions. Knowing the likely outcome profiles (or estimated probabilities) for clients considered to be at the lowest and highest levels of risk for a variety of outcomes can aid intervention and referral planning, and longer-term recovery-oriented service provision.

2. Methods

Data reported are from a longitudinal, multi-layered service evaluation/audit project, comprising 1997 index presentations by 1178 male and 819 female clients (the full cohort) over a 10 year period (Conrad et al., 2014). Most aspects of this project received an exemption from formal review by the Hunter New England Human Research Ethics Committee (letter: 25/03/2008), being viewed as part of an internal, low risk, service evaluation. Project layers involving linkages with assessments conducted primarily for research purposes received separate ethics approvals (03/12/10/3.16 and 12/11/21/5.06).

2.1. Psychological Assistance Service (PAS)

PAS (Newcastle, Australia) was established in 1997 as a community-based specialised MH service for people aged 12–25 years who may have recently experienced a psychotic episode or were potentially at increased risk based on current symptoms and impaired functioning (Carr et al., 2000). PAS assessment criteria were compatible with the Personal Assessment and Crisis Evaluation (PACE) clinic in Melbourne (Yung and McGorry, 1996), but with limited pre-screening of potential clients. However, standardised methods for assessing 'at risk mental states (ARMS)' were revised over time (Table S1), with the Comprehensive Assessment of At Risk Mental States (CAARMS) (Yung et al., 2005) utilised from 2004. CAARMS allows coding of several aspects of risk, including: family history of psychosis; recent deterioration in functioning; attenuated psychotic symptoms; and transient self-limited psychotic symptoms of less than one week's duration (BLIPS). Standardised UHR assessments prior to 2004 were re-coded to a CAARMS-equivalent format. All standardised and routine assessments at PAS were undertaken by a small, experienced, multidisciplinary team of clinicians.

2.2. Data sources and group assignment

Data were extracted from three sources: 1) PAS clinical records; 2) community-based MH services; and 3) hospital admission records. Data sets were processed separately, taking note of service delivery and admission dates, and then any duplicate entries or inconsistencies were resolved. All initial PAS presentations from 1997 to 2007 were targeted, together with additional PAS data for the subsequent 2 years (for ongoing treatment and outcome profiles). A *PAS referral date* was identified for each client for initially classifying service occasions and admissions into four timeframes: a) pre-PAS; b) within 2-months following PAS referral (i.e., 'PAS presentation window'); c) up to 2 years post-PAS (i.e., beyond presentation and initial assessment window); and d) > 2 years post-PAS.

Admissions data (e.g., demographic information, services used, length of hospital stay and diagnoses) were extracted from regional electronic hospital records systems: 'HOSPAS' (1993–2003) and 'IPMS' (2004–2009); only MH admissions from 12+ years of age were considered (see Table S1). Service contacts, diagnostic data, and presenting problems were also extracted from separate community MH databases: 'CROOS' (1997–2002); and 'CHIME' (2003–2009) (see Table S1). To account for variations in data availability, inpatient admission and community MH contact rates were expressed as days