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The assessment of attenuated psychotic symptoms in adolescents: concepts, practical approaches and prediction of risk

Rahel Pearson, Barbara Stuart, Rachel Loewy

Abstract: Early detection of those at risk for developing psychotic disorders is a growing field that creates an opportunity for intervention early in the course of illness, with potential for improved prognosis. In the last two decades a number of instruments aimed at assessing clinical risk for psychosis were developed, using various approaches. These instruments are reviewed in this paper, as well as diagnostic and clinical challenges that mental health professionals often face during the assessment of attenuated psychotic symptoms, a core syndrome indicating psychosis risk. A case example illustrates assessment and feedback techniques.

Keywords: assessment, diagnosis, high risk, prodromal, psychosis

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Introduction

While diagnosis of the schizophrenia prodrome has been a target of the psychiatry field for over a century, it is only in the last decade or so that reliable clinical assessment instruments were developed to identify these “psychosis risk syndromes”. A flurry of research ensued, with an increasing number of specialty clinics worldwide using a variety of assessment and screening tools, and a growing awareness of psychosis risk syndromes in community mental health settings. Most recently, this area of work resulted in an ongoing debate over the inclusion of an attenuated psychosis syndrome diagnosis in the upcoming 5th Edition of the Diagnostic and Statistical Manual of Mental Disorders. Despite the strong reliability of instruments, data only partially support their validity in identifying true “prodromal” cases; therefore, these instruments identify “risk syndromes,” often focused on the presence of attenuated positive psychotic symptoms (e.g. subthreshold hallucinations, delusions and disorganized thought) that are not expected to confer 100% risk for later developing a formal psychotic disorder.

The assessment of prodromal psychosis can be complicated by the often non-specific nature of symptoms, and because symptoms typically present in adolescence or young adulthood, when changes in functioning and emotional well-being are common. Furthermore, the assessment process does not end with diagnosis; once the presence of attenuated psychotic symptoms is established, educating clients and their families and addressing anxiety surrounding symptoms and their implications can be challenging. In this paper, we will review psychosis risk syndrome assessment and screening instruments, describe the assessment and feedback process with youth and families and use a case example to illustrate some common issues that arise during psychosis risk assessment. We will primarily focus on the most common risk syndrome based on the

presence of attenuated psychotic symptoms but will briefly discuss other syndromes and assessment approaches.

Interview instruments

Within the last two decades, three well-validated semi-structured interviews sensitive to sub-threshold psychotic symptoms were developed to assess the putative prodromal or clinical high risk (CHR) syndrome for psychosis. These instruments fall into two categories: (1) instruments aimed at diagnosing CHR syndromes through the presence of attenuated psychotic symptoms (APS), the presence of psychotic symptoms transient in nature, or a combination of trait and state vulnerability markers and (2) instruments aimed at detecting psychosis risk through the presence of subjective neuropsychological and cognitive deficits, or basic symptoms (BS) (Ruhrmann, Schultze-Lutter, & Klosterkötter, 2003). Mean transition time to psychosis was longer when BS were used to assess psychosis risk than when CHR criteria were used (Ruhrmann, et al., 2003), therefore BS could possibly allow for an earlier assessment of psychosis risk than APS.

However, there is a lack of prospective studies investigating the sequence with which symptoms emerge in the course of the prodromal period of psychosis, and therefore this needs further exploration.

The set of at-risk criteria based on attenuated psychotic symptoms was initially developed by Yung and colleagues through literature reviews and retrospective assessment of first episode psychosis cases. They first used DSM-III criteria, later turning to a combination of the Brief Psychiatric Rating Scale (BPRS; Overall & Gorham, 1962) and the Comprehensive Assessment of Symptoms and History (CASH; Andreasen, Flaum, & Arndt, 1992). Attenuated psychotic symptoms were defined by the presence of BPRS symptoms of attenuated level intensity held

with a reasonable degree of conviction, as assessed by the CASH (Yung et al., 2003). The Comprehensive Assessment of at Risk Mental States (CAARMS; Yung et al., 2005) was then developed to allow for more sensitivity and breadth in assessing attenuated level psychotic symptoms by defining subthreshold symptoms across a wider range of scores, with concrete anchors. The Structured Interview for Prodromal Syndromes (SIPS; Miller et al., 1999) was based on the criteria outlined by Yung and colleagues and modeled after the Positive and Negative Syndrome Scale (PANSS; Kay, Fiszbein, & Opler, 1987). Both instruments assess the presence/absence of CHR syndromes (defined below) and allow for longitudinal assessment of attenuated psychotic symptom severity. Symptoms ratings are based on onset, frequency, impairment, distress, and degree of conviction.

CAARMS

The CAARMS (Yung, et al., 2005) is a 27-item instrument with 7 subscales that assess: (1) positive symptoms (unusual thought content, perceptual abnormalities, and disorganized speech), (2) cognition change/attention (e.g. subjective experience), (3) emotional disturbance (e.g. subjective emotional disturbance), (4) negative symptoms (e.g. alogia), (5) behavioral change (e.g. social isolation), (6) motor/ physical changes (e.g. subjective complaints of impaired motor functioning), and (7) general psychopathology (e.g. mania). Frequency and intensity are rated separately for each symptom, and whether a symptom meets threshold for attenuated psychotic intensity varies based on the type of symptom. The lifetime intensity and frequency of symptoms is assessed, and scored on a scale ranging from 0 (absent) to 6 (extreme). An intake criteria checklist is included in the interview. The CAARMS allows for the diagnosis of three CHR syndromes and one psychotic syndrome; see Table 1 for a detailed overview of syndromes. The

original BPRS/CASH criteria on which the CAARMS is based demonstrated good predictive validity, with 40.8% (Yung, et al., 2003) of CHR patients converting to full psychosis by 12 month follow up in the initial study. However, in recent years reported psychotic transition rates have decreased, and a study using the CAARMS to diagnose CHR syndromes among general mental health clients had modest transition rates to psychosis (16 %) compared to earlier studies (Yung et al., 2008). The inter-rater-reliability of the CAARMS is excellent, with an overall intra-class correlation coefficient of 0.85, based on ratings gathered during 34 joint interviews by four trained clinician pairs (Yung, et al., 2005).

SIPS

The SIPS (Miller, et al., 1999) includes the Scale of Prodromal Syndromes (SOPS), a 19 item scale which allows clinicians to rate symptoms on four subscales that assess: (1) positive symptoms (unusual thought content/delusional ideas, suspiciousness/persecutory ideas, grandiosity, perceptual abnormalities/hallucinations), (2) negative symptoms (e.g. social anhedonia), (3) disorganized symptoms (e.g. bizarre thinking) and (4) general symptoms (e.g. dysphoric mood). Symptoms are rated from 0 (absent) to 6 (extreme- or severe and fully psychotic for positive symptoms), with considerations of frequency and intensity/degree of conviction included in the individual symptom rating. A rating from 0-2 is considered subthreshold and a rating from 3-5 is in the attenuated range, whereas a rating of 6 is considered fully psychotic. All symptoms are rated on the SOPS based on the last month. In addition to the SOPS, the SIPS contains the Criteria of Psychotic Syndromes (COPS), a modified version of the Global Assessment of Functioning Scale (GAF; Endicott, Spitzer, Fleiss, & Cohen, 1976), a schizotypal personality disorder criteria checklist, and an assessment of family history of mental

illness. Similar to the CAARMS, the SIPS identifies 3 CHR syndromes and 1 psychotic syndrome; see Table 1 for a detailed overview of syndrome definitions. The SIPS shows good predictive validity, with 40% of CHR patients converting to full psychosis at 2.5 year follow-up (Woods et al., 2009). The inter-rater reliability is excellent, with interclass correlation coefficients above 0.75 on all subscales (Miller et al., 2004), based on ratings of four videotapes by trained clinician (Yung, et al., 2005).

Syndromes

The SIPS and CAARMS each allow for the diagnosis of three CHR syndromes and one psychotic syndrome. On both instruments, the presence of the threshold psychosis syndrome rules out a diagnosis of a CHR syndrome. See Table 1 for an overview of CHR syndrome criteria as identified by the SIPS and the CAARMS, listed in the table in their order of typical sample prevalence.

Insert Table 1 about here

Basic symptoms

Basic symptoms are subtle subjective neuropsychological and cognitive deficits believed to indicate risk for future psychosis. The Bonn Scale for the Assessment of Basic Symptoms (BSABS) is a clinician-led semi-structured interview that assesses BS, developed in Germany based on the work of Huber (Huber, 1986). The original interview has 92 items (Vollmer-Larsen, Handest, & Parnas, 2007), although shorter versions of the BSABS are commonly used. The

version used by Klosterkötter and colleagues in the Cologne Early Recognition Project assesses for the presence of 66 Basic symptoms, divided into 5 clusters; (1) thought, language, perception, and motor disturbances, (2) impaired body sensations, (3) impaired tolerance to stress, (4) disorders of emotion and affect, and (5) increased emotional reactivity, impaired ability to maintain or initiate social contacts and disturbances of normal nonverbal expression (Klosterkötter, Hellmich, Steinmeyer, & Schultze-Lutter, 2001). Each symptom is rated as present, questionably present, or absent. The BSABS shows good diagnostic validity, with the presence of at least one basic symptom predicting schizophrenia with a probability of 70% over an average follow up period of 9.6 years (Klosterkötter et al. 2001). Inter-rater reliability of the BSABS items ranged from fair ($Kappa = 0.21$) to very good ($Kappa = 1.00$) based on ratings gathered during 18 joint interviews by a trained clinician pair (Vollmer-Larsen, et al., 2007).

There is growing consensus that the SIPS/CAARMS and BSABS approaches can be complementary in the detection of psychosis risk, and can be used to guide treatment specific to each type of syndrome (Bechdolf et al., 2005). The European Prediction of Psychosis study (EPOS) in Germany combines the SIPS and BSABS to determine psychosis risk, and found transition rates to psychosis of 19% at 18 month follow up, with the combined approach achieving the highest sensitivity (Ruhrmann et al., 2010).

Screening instruments

Given the intensive time and staff training required to use the structured psychosis risk interviews, several self-report -screening measures have been developed to identify those individuals who are most likely to benefit from the interviews. All measures were developed for use in a two-stage screening process with clinical interview and not to be used alone for

diagnosis (see Rosenbaum & Olsen, 2006 for a review). The Prodromal Questionnaire has long (PQ; 92 items) and short (PQ-B, 21 items) versions, with the latter focused on positive symptoms only, along with related distress and impairment. The PQ showed moderate agreement with SIPS diagnoses in an early psychosis clinic-referred sample with 90% sensitivity and 49% specificity, while the PQ-B showed stronger specificity in a similar sample, with 89% sensitivity and 68% specificity (Loewy, Bearden, Johnson, Raine, & Cannon, 2005; Loewy, Pearson, Vinogradov, Bearden, & Cannon, 2011). The PROD-SCREEN has 29 items and showed moderate agreement with SIPS diagnoses in a sample of first-degree relatives of schizophrenia patients, and in a general population sample, with less accurate performance among psychiatric outpatients (Heinimaa et al., 2003). Preliminary data for the PRIME SCREEN, developed by the authors of the SIPS, was promising (Miller et al., 2004), and a revised 12-item Japanese version showed perfect sensitivity (100%) and good specificity (74%) against SIPS diagnoses in an outpatient psychiatric sample, with predictive validity at 6-month follow-up of 11% (Kobayashi et al., 2008). Three other self-report screens with published data include the Self-Screen –Prodrome (Muller et al., 2010), the Youth Psychosis At Risk Questionnaire (Ord, Myles-Worsley, Blailles, & Ngiralmu, 2004), and the Adolescent Psychotic-Like Symptom Screener (Kelleher, Harley, Murtagh, & Cannon, 2011), although all calculated concordant validity using full psychosis/schizophrenia interviews or rating scales that were not psychosis risk measures *per se*. In sum, screening measures have shown moderate to good concordant validity against risk syndrome diagnosis, with less data available on validity of predicting conversion to full psychosis. They may be most useful in screening mental health patients, with less evidence at this point for use with the general public, which carries a high false positive rate.

Transition to psychosis

The percentages of CHR individuals who develop full psychosis range from 16% by 24 month follow-up (Yung, et al., 2008) to 70% by 9.6 years (Klosterkotter, et al., 2001), with average transition rates across studies of 36.7% (Ruhrmann, et al., 2003). Transition to psychosis was more likely in individuals with impaired role and social functioning, prodromal psychotic symptoms of longer duration, a family history of psychosis and more severe levels of prodromal symptoms at baseline (Cannon et al., 2008; Yung, et al., 2003). Transition rates are highest in the 6-month period after CHR diagnosis, with decreasing rates over time (Cannon, et al., 2008). Similar to risk assessment across all areas of medicine, transition rates also depend upon the selection process for the sample, with higher rates in “enriched” samples such as those seeking help specifically for potential CHR syndromes (Yung et al., 2008).

Of note, transition rates to psychosis have declined over time in the published literature (Yung et al., 2007), indicating an increased proportion of people falsely identified as being “at-risk” for developing psychosis. Yung and colleagues suggest that individuals are being identified earlier in the course of their illness, pointing out that the duration of untreated attenuated psychotic symptoms in research samples has progressively decreased over time. As mentioned earlier, a longer period of untreated symptoms is associated with increased risk of transition to psychosis. Alternatively, previously employed follow-up times might not be sufficient in length to see these individuals ultimately transition to full psychosis. Outcomes may also possibly be more varied in the early course of CHR syndromes than later on. Finally, widely available interventions (psychosocial or pharmacological) may further contribute to a decrease in transition rates, as treatment is never withheld from patients in “naturalistic” longitudinal studies.

In addition to tracking psychotic transition rates, two recent studies attempted to characterize the functional and symptomatic outcomes of CHR “false-positives”. A significant percentage of “false-positives” continued to experience attenuated level psychotic symptoms, functional impairment, or both at follow up (Addington et al., 2011; Schlosser, Jacobson, Niendam, Bearden, & Cannon, 2011). Similarly, ongoing longitudinal studies are focusing on functional outcomes independent of conversion status, with a recent study showing that poor verbal learning and memory at baseline predicted worse functional outcome up to 13 years later (Lin et al., 2011). It is still unclear how to best conceptualize the symptoms and impairment seen in this group; although Schlosser and colleagues speculate that the stable attenuated level psychotic symptoms and functional impairment seen in these individuals might align more closely with a diagnosis of Schizotypal Personality Disorder than a CHR syndrome.

Case study

The following vignette illustrates the assessment of attenuated positive symptoms in an adolescent, using the SIPS. This represents a typical case seen at the Prodrome Assessment, Research and Treatment (PART) clinic in the Department of Psychiatry at The University of California, San Francisco. Along with obtaining a description of the adolescent’s symptoms in her own words, a key goal of the assessment is to evaluate presenting symptoms across dimensions of onset, duration, frequency, degree of distress, degree of conviction or meaning attached to the experience and degree of interference in life areas. In order to protect participant confidentiality the vignette is a composite interview and any identifying information was altered.

Clinical Vignette: Alicia is a sixteen- year old Latina female who was brought in by both parents upon the suggestion of their daughter’s therapist. The therapist has been seeing Alicia for six

months for generalized anxiety and angry outbursts starting shortly after her parents divorced. The therapist reports that the divorce, although amicable, was stressful for Alicia and her younger brother. The therapist was concerned about an increase in Alicia's anxiety and depression symptoms and a recent emergence of odd ideas that familiar people had changed in some way. The therapist was unsure what to make of Alicia's new concerns and wondered if Alicia was exaggerating her level of distress in order to get both parents more involved or merely coping poorly in reaction to changes in the family. In session with her therapist, Alicia reported that at times, her surroundings would seem "unreal" but could not elaborate further. Over the past six months, Alicia became withdrawn and more "stressed" about what her friends think of her. Thoughts that people are communicating with her in special ways are increasingly preoccupying. Parents report that up until three months ago, Alicia performed well academically, receiving B's, and socialized daily with several close friends from her soccer team. However, Alicia now has trouble completing assignments and is at risk of failing one class. She has missed several soccer practices in a row and comes straight home from school instead of hanging out with friends.

At the PART appointment, Alicia was well-groomed and dressed appropriately for her age. There were no signs of psychomotor retardation; however, she exhibited moderate tension (e.g., pulling at her clothing and tapping her fingers). Alicia was engaged throughout the interview and maintained good eye contact, except during the times when discussing her sadness over her parents' divorce. She appeared depressed and anxious. She denied suicidal and homicidal ideations. She answered questions spontaneously and directly, although she spoke softly throughout the conversation, particularly when mentioning current unhappiness. Alicia's thought

process was linear and coherent. Alicia was able to answer questions and recall her past without difficulties. When questioned about her depression and anxiety, Alicia reported that she was having “a hard time” and that she found therapy helpful.

A fictionalized excerpt from the initial interview transcript is as follows. A discussion of confidentiality is omitted for purposes of brevity, but it always included, as is a parallel interview with parents, legal guardian or other informant.

CLINICIAN: Hi Alicia, I’m Barbara, I’ll be talking with you today. I work with teens that are worried about recent changes in their thoughts and feelings. I’m going to ask you some questions about experiences you might have. I’ll ask a range of questions to see if you have experiences similar to the teens we see here at the PART program. Regardless, if you’re a good match for our program, or not, we’ll try to offer some help regarding what’s bothering you. Do you have any questions before we begin?

ALICIA: So you see a lot of people like me?

CLINICIAN: Most people I see are teenagers like you, who’ve recently felt confused about their thoughts or feelings and for most people, these experiences start to get in the way of school, friends or sports and hobbies. Some of the questions I will ask you might ring true for you and some might not. Could I go ahead and ask you some questions?

ALICIA: OK.

CLINICIAN: Have you had the feeling that something odd is going on or that something is wrong that you can’t explain?

ALICIA: Yeah. Things are totally different in my family. My mom and dad act like everything is OK but it's not. They say they still care about each other but if they really cared they wouldn't have gotten divorced.

CLINICIAN: OK, you feel things at home aren't the same anymore because your parents aren't together. I'm wondering if you've had the feeling that something else is wrong that you couldn't explain why it was happening.

ALICIA: Oh, well...hmm...(long pause). Lately I've felt like my friends aren't who they say they are, as if they are pretending to be my friends. I don't know...it's confusing. Sometimes when I'm hanging out with my friends it feels like I'm in a dream- like they're not really real- like they're standing in for my real friends.

CLINICIAN: What about your friends seems unreal or not what they used to be like?

ALICIA: It's kinda hard to explain. Sometimes it feels like what they say has a different message underneath; almost like they're speaking in code just for me and it's not really them talking. It's different now. It's like they don't really mean what they say but everyone else acts as if everything's normal. I'm starting to wonder if I'm going crazy or something.

CLINICIAN: Sounds like this really scares you. What do you make of it? What do you think is going on?

ALICIA: Sometimes I think that maybe my friends were replaced with other people. I saw that in a movie once and I wonder if that could really happen. I know that's impossible but it still freaks me out.

CLINICIAN: Do you have other explanations for what's going on?

ALICIA: (silence for a few seconds). Maybe I'm just a really sensitive person.

CLINICIAN: How much do you believe that these experiences are a result of your friends being replaced by other people?

ALICIA: Mmmm.... I'm not sure.

CLINICIAN: If you had to put a percentage on it, from 0 to 100%, with 0 being definitely not true, and 100% being absolutely true, no way I could convince you otherwise, what would it be?

ALICIA: Maybe Fifty-fifty?

CLINICIAN: Do you do anything differently because of your worry that your friends might be replaced with other people?

ALICIA: I don't hang out with my friends as much anymore, especially if they want to go to the mall. It's too stressful when we hang out there, I worry too much and can't pay attention.

CLINICIAN: When did you start feeling that your friends might be replaced with other people?

ALICIA: About three months ago.

CLINICIAN: Did anything change just before you started feeling this way?

ALICIA: No, not really. Soccer season started as usual. They've been my friends nearly all my life.

CLINICIAN: How often in the past month have you had these thoughts about your friends?

ALICIA: A lot now.

CLINICIAN: What's a lot for you?

ALICIA: A few times a week. I used to worry only every once in a while after we would argue. Now it doesn't matter if we are all getting along- I still feel something's weird.

CLINICIAN: When you worry that your friends could be replaced by others, how long do these thoughts last seconds, minutes, or hours?

ALICIA: I worry almost the entire time I'm with them...it could be for hours, off and on until I decide to get home. I feel better when I'm home and the worry goes away. When I see them at school I tell myself, no, this is just silly and sometimes that helps.

CLINICIAN: You mentioned that sometimes you experience your friends speaking in code, just for you. Could you tell me more about that?

ALICIA: It's like people are communicating on another mental frequency with me.

CLINICIAN: Does that happen with other people too, besides your friends?

ALICIA: It can happen with anyone, not just my friends.

CLINICIAN: Do you ever think that people can read your mind?

ALICIA: No, it's not like people can read my mind! That would be weird. But the way people move, or a gesture someone makes seems to say a lot.

CLINICIAN: I want to be able to understand your experience- see it how you see it. Could you tell me about a recent time when you felt things happening around you had a special meaning for just you?

ALICIA: Umm, well, the other day, I was sitting on the bus and the woman sitting in front of me tucked her hair behind her ear, just as she was looking straight at me. I wondered if she was trying to secretly tell me I need to keep, you know, my eyes and ears open, to be careful.

CLINICIAN: Did you feel that it could just be in your head or did you think this was real, that she was secretly telling you that you needed to be careful?

ALICIA: At the time I was confused. I was only 50% sure that's what she meant.

CLINICIAN: How often has that happened in the past month?

ALICIA: Lately, it happens two or three times a week. It's happening more often now since soccer season began.

CLINICIAN: Does this experience bother you?

ALICIA: It makes me feel antsy and worried. Oh, and it makes it hard for me to concentrate on what I'm doing in school.

CLINICIAN: It sounds like you're having the experience of receiving special messages from people both at school and outside of school. Did I get that right?

ALICIA: Yeah.

CLINICIAN: What do you do when this happens?

ALICIA: I don't know. I try to concentrate on something else. If I'm on the bus, I'll take out a book and read or draw on a piece of paper when I'm in class, something like that.

These symptoms were rated in the attenuated range, with a 4 rating ("moderately severe") on unusual thought content. The rating is based on Alicia's endorsement of puzzlement and confusion regarding familiar people, feeling that others had changed (replaced by copies) and ideas of reference (people communicate in special ways). These thoughts are unanticipated and are experienced as not within Alicia's control. Alicia reports that she is 50% sure that the experiences she's having are real and that these thoughts are compelling, preoccupying, distressing. These thoughts are also getting in the way of school and socializing with friends. Given that these experiences started within the past year (6 months ago), occur at least once per week (three to four times per week to daily) and cause daily distress, these symptoms qualify for an APS syndrome on the SIPS/SOPS.

The case illustrates that symptoms develop over time, becoming progressively worse over the course of a year. Alicia's thoughts that her friends might be imposters or that she is receiving

special messages from strangers are compelling but skepticism about the reality of these ideas remains intact. She realizes that this is not really happening, but at times, for example, when she is at the mall with friends, the thought is overwhelming and she must get home to feel calmer. In the interview, Alicia readily provided an alternative explanation for these experiences (her own emotional sensitivity) with minimal prompting from the examiner.

Many clinicians might consider these symptoms to be fully psychotic, and would not ask questions to determine her level of conviction (Jacobs, Kline, & Schiffman, 2011). The advent of the SIPS and CAARMS has set an arbitrary threshold to full psychotic intensity of symptoms that was never defined in DSM-IV (American Psychiatric Association, 1994) , and may differ from the threshold set by clinicians in typical practice. Key determinants of a symptom being at a fully psychotic level of intensity on the SIPS are full conviction regarding the externally generated nature of the symptoms well as the frequency and duration of symptoms. Although the SIPS provides a definition that can be clearly operationalized and applied reliably, future research should examine the validity of the psychosis threshold for purposes of defining risk and outcome (Yung, Nelson, Thompson, & Wood, 2010).

Communicating Assessment Results

Psychosis risk assessment does not end with the completion of the SIPS or CAARMS. Communicating the results of the assessment is an opportunity to provide psychoeducation, manage anxiety and give adolescents and families hope. As is always the case in clinical work, it is often helpful to use the teen's language to describe the symptoms in defining the risk syndrome (e.g., in Alicia's case: "you mentioned sometimes feeling like your friends were

replaced by other people, but it's hard for you to tell if that's real or not"). Similar to all diagnostic feedback, basic education includes a brief summary of the available evidence: definition of the diagnosis, basic etiology, and prognosis of risk rates, highlighting the importance of early intervention and recommending treatments.

When families are given information they gain perspective and a greater sense of control over emerging changes that may otherwise be puzzling and disruptive. Feedback may require more than one visit as families can only take in a small amount of information at a time, especially under a high emotional load. This often requires a careful balance between giving sufficient information about risk without increasing the family's anxiety about their adolescent's current symptoms. Informing families of the actual risk (transition rates to psychosis are declining, and are as low as 16% in recent studies (Yung, et al., 2008)) can alleviate the doom families may feel. At the same time, it is important to communicate to families that addressing symptoms in the early stages may prevent further decline in functioning regardless of the diagnostic outcome.

Families express a range of emotional reactions to this information. In order to support treatment engagement, it is important to process these reactions with the family while addressing misconceptions and stigma through an accurate and hopeful portrayal of attenuated psychotic symptoms, and of established psychosis. Family members consistently report that before a risk assessment they were not sure what to make of their child's recent changes in behavior and mood; they often felt confused, not knowing whether to take the "wait and see approach" or seek professional advice: "At first I thought she was going through a phase. All teenagers go through some angst and get moody but it seemed like there was something more than that. I wasn't sure."

Many families have historical experience with a relative with schizophrenia and fear that their child will experience a similarly devastating future of chronic institutionalization. For most people, the words “psychosis” or “schizophrenia” can be stigmatizing labels. However, symptoms such as unusual perceptual experiences or thoughts are part of a continuum of normal experiences (Johns & van Os, 2001). In describing the concept of a continuum to families, the example of social anxiety can be used. Social anxiety falls on a continuum where an adolescent can move (in either direction) from having a normative concern about what others think of him/her to less socially acceptable paranoid ideation. It is the interpretation of these experiences that causes distress or disability and these symptoms are amenable to psychological interventions used to treat depression and anxiety, such as CBT. However, normalization of the experience does not mean there is nothing to worry about. The distress and accompanying interference in life areas must be taken seriously. Communicating a balanced perspective can be validating and empowering to the adolescent and the family. The presence of attenuated psychotic symptoms and their associated distress and impairment can be taxing for the adolescent’s family. We often recommend that families find their own support, such as individual therapy or a parent support group.

Differential diagnosis of CHR syndromes

CHR syndromes are often superimposed on pre-existing conditions, overlap to varying degrees with other disorders that are common in adolescence, and attenuated psychotic symptoms are often present across a variety of disorders. Therefore, accurately differentiating between CHR syndromes and other psychiatric problems might not be possible in the initial stages of disturbance, especially in younger patients. In order to minimize “false-negatives,” research

studies typically follow individuals who present with attenuated psychotic symptoms and comorbid DSM-IV diagnosis longitudinally in order to ascertain eventual risk for conversion to psychosis. This ambiguity regarding diagnosis and outcome can be anxiety-provoking for clients and their families. Continual psychoeducation and feedback to families can help, and attenuated psychotic symptoms, as well as other symptoms the client presents with, should be targeted in treatment regardless of the formal diagnosis. We will now briefly consider common comorbid disorders and, where possible, differential diagnosis for CHR adolescents.

Differentiating between substance-induced (sub- threshold) psychotic symptoms and CHR syndromes

Substance use and abuse are, of course, common among CHR youth and (subthreshold) psychotic experiences are common in non-CHR individuals using substances (see for example D'Souza et al., 2000). Similar to assessing any potential substance-induced disorder, the first task is to establish a timecourse, determining whether the attenuated psychotic symptoms are limited to periods of intoxication and withdrawal. Substance use can interact with underlying vulnerabilities (genetic or environmentally- caused) to trigger attenuated and full psychosis, with accumulating evidence that early cannabis use may play such a role (Caspi et al., 2005).

However, without clear periods of attenuated psychotic symptoms outside of substance use, a CHR syndrome cannot be diagnosed. Drawing a timeline of attenuated psychotic symptoms and substance use with the patient can help clinicians make this distinction.

Case example: A 15 year old male who recently began smoking cannabis regularly heard a voice calling his name while under the influence. This psychotic- like experience would not be considered part of a CHR syndrome, because the experience was limited to periods of substance

use. However, if this experience started to occur regularly during periods of sustained abstinence, the presence of a CHR syndrome would become more likely.

Mood and Anxiety disorders

Comorbidity between CHR syndromes and mood and anxiety disorders is high: 59% of CHR individuals are estimated to meet criteria for a mood disorder, and 28% to meet criteria for an anxiety disorder (Rosen, Miller, D'Andrea, McGlashan, & Woods, 2006), consistent with retrospective reports of anxiety and depression before illness onset in psychotic populations (ander Heiden & Hafner, 2000) . These mood and anxiety symptoms can be caused or aggravated by distress associated with attenuated psychotic symptoms, can emerge independently from attenuated psychotic symptoms, or the attenuated psychotic symptoms can mark the severity of the mood/anxiety syndromes. Additionally, there is evidence suggesting that CHR individuals with comorbid mood- and anxiety symptoms have worse outcomes longitudinally and an increased risk of transitioning to psychosis (Schlosser, et al., 2011; Yung, et al., 2003). Finally, readers should be reminded that mood disorders with psychotic features are a targeted outcome of the CHR syndrome; the definition of psychotic “conversion” is not limited to schizophrenia (Haroun, Dunn, Haroun, & Cadenhead, 2006). Suspected attenuated psychotic symptoms which co-occur with mood- and anxiety disorders need to be assessed along the dimensions of onset, frequency, impairment, conviction and distress just as would be the case if these symptoms occur without comorbid symptomatology.

What makes the CHR syndrome different from normal adolescent experiences?

Subthreshold psychotic symptoms are common in the general population with a significant percentage of adults indicating that they experienced psychotic-like phenomena at some point in their lives (Johns & van Os, 2001) and may be especially common in adolescence (McGorry et al., 1995). However, the majority of these individuals do not have a psychotic disorder.

Although infrequent psychotic-like experiences are common, frequent psychotic-like experiences are not (Yung et al., 2009), and an increase in frequency and distress is associated with an increased likelihood of developing a psychotic disorder (Hanssen, Bijl, Vollebergh, & van Os, 2003). Therefore, the SIPS and CAARMS rely on frequency, recent onset or worsening (to indicate a progressive process) and associated distress or impairment to separate threshold attenuated psychotic symptoms from typical and subthreshold experiences.

Case example: A 16 year old male reported that he felt “so close” to his girlfriend, that at times he felt he might be able to “read her mind”. He had this experience twice monthly, and reported no significant distress or impairment. This kind of magical thinking would be conceptualized as normative in adolescence. In contrast, a 17 year old female who was afraid, but not convinced, multiple times a week that classmates could read her mind and that they might know “all her secrets”, reported that this experience was very anxiety provoking. Whenever she felt that her peers might be able to read her mind she avoided the cafeteria at school, and would skip eating lunch. This symptom was rated in the attenuated range and she was diagnosed with a CHR syndrome.

Differentiating between PDD and CHR syndromes

Children and adolescents diagnosed with Pervasive Development Disorders (PDD) can present with social impairments, disorganized thought and speech, blunted affect and constricted interests which are also common in adolescents diagnosed with CHR syndromes. There is evidence suggesting that individuals with PDD have a higher risk of developing psychosis than individuals who do not meet criteria for PDD (Stahlberg, Soderstrom, Rastam, & Gillberg, 2004), and some studies report significant comorbidity between PDD and CHR syndromes (Zieman et al., 2009). In some cases, PDD can be differentiated from CHR syndromes by developmental history: pervasive developmental disorders have an early onset (prior to age 3 for autism), and are stable over time. In contrast, CHR syndromes often emerge in adolescence or early adulthood, and are diagnosed after a period of increased symptoms and a deterioration of functioning compared to baseline. However, the expression of PDD symptoms can change in adolescence, with what can appear to be “odd ideas” compared to peers (Gillberg, 1984). Furthermore, determining the absence or presence of CHR syndromes in individuals with a low IQ using traditional interview methods might be unreliable (Dosssetor, 2007), and this needs to be considered when diagnosing CHR syndromes in those with PDD.

Conclusion

Strides have been made in the assessment of psychosis risk, allowing for earlier interventions in the course of psychosis. Moving forward, improving the predictive validity of diagnostic methods of assessment interviews should remain a point of focus. The identification of biomarkers predictive of psychosis risk could further aid the accurate diagnosis of CHR syndromes, and increase predictive validity.

The specificity of the available diagnostic instruments for prodromal symptoms became a focus point in the debate over the inclusion of an attenuated psychosis syndrome diagnosis in DSM-V. The suggested criteria for this attenuated psychosis syndrome include the presence of at least one of three attenuated positive psychotic symptoms (disorganized speech, delusions and/or hallucinations), present with a frequency of at least once weekly in the last month. Additionally these symptoms worsened in the last year, cause distress, disability, or help seeking behavior, and are not better explained by another DSM-V disorder (American Psychiatric Association, 2010). Proponents argue that the inclusion of this risk syndrome will stimulate research and the development of targeted interventions, as well as encourage early detection of psychosis risk in community settings through more widespread knowledge of risk syndromes (Carpenter, 2009). However, although identifying CHR syndromes was accomplished reliably in specialized research programs, it is still questionable if this assessment will be similarly reliable in community settings. Thus, assessment of the psychosis risk syndrome is currently being tested in DSM-V field trials. Opponents argue that including this diagnosis in DSM-V might lead to the unnecessary stigmatization of individuals who meet criteria, especially given the large false-positive rate, and could cause these individuals to be exposed to interventions with potentially harmful side effects, such as antipsychotic medication (Corcoran, First, & Cornblatt, 2010).

In sum, early identification of psychosis risk is a promising emerging field and future directions for research should include increasing predictive validity. Predictive validity of assessment interviews and their applicability in community mental health settings has been and likely shall remain an important consideration in the debate over inclusion of a psychosis risk syndrome in DSM-V. Meanwhile, for clinicians who currently see adolescents with CHR syndromes, we hope

that this review provides helpful education around the basic concepts, challenges and useful approaches to working with CHR adolescents and their families.

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Table 1: *CAARMS and SIPS syndromes.*

Syndromes/Groups	CAARMS	SIPS
CAARMS: Attenuated Psychosis group	At least 1 positive symptom present at threshold intensity or frequency.	At least 1 positive symptom present in the attenuated range.
SIPS: Attenuated Positive Prodromal Syndrome (APPS)	Symptom is present in the past year, but present for no more than 5 years.	- Symptom started or worsened in the last year - Occurs at least once per week over the past month.
CAARMS: Brief Limited Intermittent Psychotic Symptoms (BLIPS)	- Positive symptom(s) present at psychotic threshold - Present within the last year, but for no more than 5 years.	- At least 1 positive symptom(s) present at psychotic threshold - Symptom started within the last 3 months
SIPS: Brief Intermittent Psychotic Symptom Syndrome (BIPS)	- Occurs at least 3-6 times a week for more than 1 hour on each occasion, or daily for less than 1 hour. - Symptoms are present for less than 1 week, and remit spontaneously on each occasion.	Occurs at least several minutes a day, at least once per month.
CAARMS: Vulnerability group	A SOFAS¹ score drop in the last year of at least 30%, sustained for at least a month	A GAF² score drop of at least 30% in the last month compared to 12 months ago
SIPS: Genetic Risk and Deterioration CHR syndrome (GRDS)	Criteria for Schizotypal Personality Disorder are met, or client has a first degree relative with a psychotic disorder.	Criteria for Schizotypal Personality Disorder are met, or client has a first degree relative with a psychotic disorder.
CAARMS: Psychosis Threshold	Psychotic symptoms are present	A current or lifetime presence of psychotic symptom(s)
SIPS: Psychotic Syndrome	- Occur at least 3-6 times a week for more than 1 hour on each occasion, or daily for less than 1 hour. - Symptoms are present for at least 1 week.	Occur more than 1 hour a day for an average of 4 days a week.

¹ SOFAS: Social and Occupational Functioning Assessment Scale, (Morosini, Magliano, Brambilla, Ugolini, & Pioli, 2000) ²GAF: Modified Global Assessment of Functioning Score (Endicott, Spitzer, Fleiss, & Cohen, 1976)