



Early Intervention in the Real World

At-risk mental state (ARMS) detection in a community service center for early attention to psychosis in Barcelona

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Abstract

Aim: To describe the strategy and some results in at-risk mental state (ARMS) patient detection as well as some of the ARMS clinical and socio-demographical characteristics. The subjects were selected among the patients visited by an Early Care Equipment for patients at high risk of psychoses, in Barcelona (Spain) during its first year in operation.

Methods: Descriptive study of the community–team relations, selection criteria and intervention procedure. Description of patient's socio-demographic and symptomatic characteristics according to the different instruments used in detection and diagnoses, taking account of four principal origins of referrals: mental health services, primary care services, education services and social services.

Results: Twenty of 55 referred people fulfilled the at-risk mental state

criteria, showing an incidence of 2.4 cases per 10 000 inhabitants. They were mainly adolescent males referred from health, education and social services. Overall, negative symptoms were predominant symptoms and the more frequent specific symptoms were decrease of motivation and poor work and school performance, decreased ability to maintain or initiate social relationships, depressed mood and withdrawal.

Conclusions: It is possible to detect and to provide early treatment to patients with prodromal symptoms if the whole matrix of the community – including the social services – contributes to the process. The utilization of a screening instrument and a two-phase strategy – the second carried out by the specialized team – seems to be an appropriate approach for early psychosis and ARMS detection.

Key words: at risk mental state, detection strategy, early psychoses, first psychotic episode, prodromal symptoms.

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INTRODUCTION

In general, the investigations focused on the identification of personal and social consequences of duration of untreated psychosis (DUP) suggest that the longest DUP are associated with an unfavorable disorder course^{1,2} with the consistent increase in costs that it implies,³ including, probably, the total economic costs of the disorder.⁴ Moreover, some studies conclude that the early course of psychosis is the most active stage of the overall disorder and most permanent consequences have its origin in this early stage.⁵

Consequently, it is a priority for mental health care to implement strategies designed to reduce DUP and to intervene as soon as possible. One of the key elements to achieve it is the detection of people at risk of psychosis, also called 'at-risk mental state' (ARMS),⁶ a derivation of the ultra high risk (UHR) concept. The second element is the early diagnostic of the beginning of the psychosis.⁷ Different strategies for ARMS identification have been developed with this intent.

One UHR detection proposed strategy (i.e. UHR strategy)⁸ – with a big impact in research – is to register characteristic symptoms of late prodromal

states (positive symptoms) while considering several risk factors for psychotic disorders, such as age, schizotypal personality and familiar antecedents of psychosis. The UHR criteria have been adapted as ARMS concept by other research and clinical teams, such as the addition of a negative symptoms group⁹ and a basic symptoms group.¹⁰ Based on this premises, several strategies aiming to the detection of ARMS have been devised.^{5,9–11}

Early intervention in psychoses necessarily implies the development of strategies designed to improve the rates of detection in primary care, education and social services settings.¹¹ Also, awareness in the general population regarding psychosis and networking among different community services must be improved.¹² As an example, our Early Care Equipment for At-Risk of Psychosis Patients (ECEARP), the EAPPP, carries out 50 meetings each year (a 2 month meeting with each service, approximately) with all the community services with which it collaborates. One of the objectives of such shared meetings is to contribute to the training of professionals by encouraging the use of an instrument for the screening of high risk of psychosis individuals. A key step in the achievement of this objective is the progressive training of the referral professionals in the use of practical screening instruments to detect people at moderate risk. In that way, the ECEARP can work as consecutive filter inside the Primary Health, Social and Pedagogic Care System, because referral rates were higher among those professionals with a higher awareness of the disorder.⁵

In 2006 in Barcelona (Spain) the Early Care Equipment for At-Risk of Psychosis Patients started to work, focusing on early treatment and help for ARMS patients (EMAR in Spanish), for individuals with a first psychotic episode (FEP) and for highly vulnerable children (HVC) due to an accumulation of risk factors of psychopathology. The aim of this study is to describe the strategy and the results of the ARMS detection programmes used and the clinical and socio-demographic characteristics of those patients visited for the first time at the Service during its first year of operation.

METHOD

Setting

The team consists of two psychiatrists/psychotherapists, a psychologist/psychotherapist, a social worker, two nurses specialized in mental health and administrative staff. Its assigned population is 83 567 inhabitants from a central urban

sector in Barcelona, from middle and low-middle classes and with a progressive increment of immigration. It works in a network base with the sanitary services (primary, secondary and tertiary, including mental health services), the education services (psycho-pedagogy attention teams and primary and secondary education centers) and the social services (preventive attention teams, primary social care attention, justice institutions for the protection of young in a risk situation) of its sector, in detection and treatment as well as at a preventive and formative level.

Participants

We selected consultants as ARMS/EMAR when they met the criteria proposed by the *European Prediction of Psychosis Study* (EPOS),¹³ with two modifications in such criteria: (i) for organizational reasons, the criteria concerning basic symptoms was disregarded and (ii) the age range was expanded from 14–30 to 12–56 years in order to improve truly early detections,⁵ and to detect the first manifestation of the delusional disorder, which can begin at the third or fourth decade of life. Consequently, each patient needed to have either *attenuated positive symptoms* (APS) as assessed by the *Scale of Prodromal Symptoms* (SOPS),^{14,15} *Brief limited intermittent psychotic symptoms* as assessed by the *Positive and Negative Symptoms Scale* (PANSS),^{16,17} or family vulnerability, with functioning impairment as measured by the *Global Assessment Functioning* (GAF)¹⁸ (Table 1).

The exclusion criteria used were common to the study EPOS: (i) diagnosis of a previous psychotic episode with a duration greater than 1 week; (ii) psychotic symptoms due to a substance abuse or to an organic mental disorder and (iii) previous diagnosis of mental retardation. Prior exposure to anti-psychotic medication was not an exclusion criterion because those drugs are frequently administered to FEP and ARMS patients in our context (4/20 in our ARMS sample).

Instruments

The socio-demographic data was obtained from the 'Catalan Health Institute' Case Register [Instituto Catalán de la Salud] (ICS, unpubl. data, 2006).

As screening instrument we used the *Early Recognition Inventory checklist* (ERIRAOS), based on the *Retrospective Assessment of the Onset and Course of Schizophrenia and Others Psychosis*.¹⁹ That scale assesses the presence/absence of unspecific symptoms, of late prodromal and psychotic symptoms during the last 12 months, and its intensity

TABLE 1. Inclusion criteria for the ARMS group of the EAPPP

Age: from 12 to 56 years old.

Presence of any of the following conditions:

- A Attenuated positive symptoms:** Presence of at least one of the following SOPS symptoms with a score between 3 and 5 and an appearance of several times per week for a period of at least one week: Unusual thought content / delusional ideas, Suspiciousness / persecutory ideas, Grandiosity, Perceptual abnormalities / hallucinations, Disorganized communication, Odd behaviour or appearance.
- B Brief limited intermittent psychotic symptoms:** Presence of at least one of the following PANSS symptoms, score ≤ 4 , that resolve spontaneously in 7 days and an interval between episodes with these symptoms of at least one week: Delusions, Conceptual disorganization, Grandiosity, Hallucinations, Suspiciousness.
- C Familial risk plus reduced functioning:** A change in mental state or functioning leading to a reduction of 30% or more on the GAF for at least one month within the last year compared to the highest level of previous functioning, plus at least one of the following risk indicators: 1- One first- or second-degree relative with a history of any DSM-IV psychotic disorder (not due to a medical factor or substance induced) (EPOS criteria)¹³, 2- A schizotypal personality disorder of the index person according to DSM-IV.

ARMS, at-risk mental state; EAPPP, Equip d'Atenció Precoç als Pacients en risc de Psicosis; GAF, global assessment functioning; PANSS, positive and negative symptoms scale; SOPS, scale of prodromal symptoms.

variations, and the presence of some risk factors. We used a still non-validated Spanish version of the questionnaire, re-translated twice from English and German version.²⁰

As recommended by the EPOS criteria,¹⁰ we used the SOPS in order to assess APS.¹⁴ We used a Spanish version of the instrument with excellent predictive validity and high internal consistency.¹⁵ Intermittent psychotic symptoms were assessed using the Spanish version of the PANNS,¹⁶ validated in Spanish population¹⁷ and with moderate internal consistency in PANSS-P and high internal consistency in PANSS-N.

Procedure

The research protocol was approved by the Jordi Gol Ethics Committee, an organization supporting investigation in primary healthcare in Catalonia. The informed consent was signed by the participants and/or their parents.

Professionals from the community network referred the patients when they scored 3 or more in the ERIRAOS and/or when doubts did exist concerning their risk of psychosis status in the information or shared group inter-professional sessions conducted by the EAPPP (more than 50 a year). In case

that the instrument had not been fully administered it was completed in the first visit to our team. The participants scoring 3 or more in the ERIRAOS – or any positive answer in its second or third part – were administered the PANSS, the SOPS and the GAF in a second and a third clinical interview. DSM-IV-TR criteria were used to assess the presence of psychotic disorder and schizotypal personality. Organic conditions were ruled out based on physical exploration and somatic screenings (blood and urine analysis, Computed tomography and/or Magnetic resonance imaging, etc.). The possible outcomes of this process were (i) fulfilling the ARMS or FEP criteria, (ii) fulfilling the criteria for HVC (operationalized as having 10 or more risk factors, as determined by the Mental Health Items List (LISMEN), an ad hoc checklist that is currently being validated) or (iii) not fulfilling any such criteria and therefore being referred to another specialized service in the mental health network. The LISMEN is a checklist of 87 items assessing risk factors for severe mental disorder throughout childhood and adolescence. It is applied in a semi-structured interview and covers four age groups: 0–2, 3–5, 6–11 and 12–17. Scores indicate risk factor presence or absence. The level of reliability is rating from 0.79 to 0.98.²¹

Statistical analysis

Analyses were conducted using SPSS for Windows 13.0.²² Descriptive analyses (i.e. mean, confidence interval, percentiles, frequencies and percentages) were used in order to describe the ARMS group characteristics.

RESULTS

Figure 1 summarizes the possible trajectories followed by participants along the different arms of the study, which was carried out from June 2006 to June 2007. The reference population size was 83 587 inhabitants and 2.4 ARMS cases per 10 000 inhabitants were detected.

Table 2 shows the general socio-demographic characteristics of the ARMS group. The ARMS Group was composed mainly of teenagers (mean age, 15.8 years). There was a greater proportion of males and most participants had attained the secondary education level. A tenth of the participants were younger than 14 years old. They were evenly distributed across the three areas attended by the Team: health, education and social services. The distribution of participants across socio-economic levels showed no differences with the exception of a small

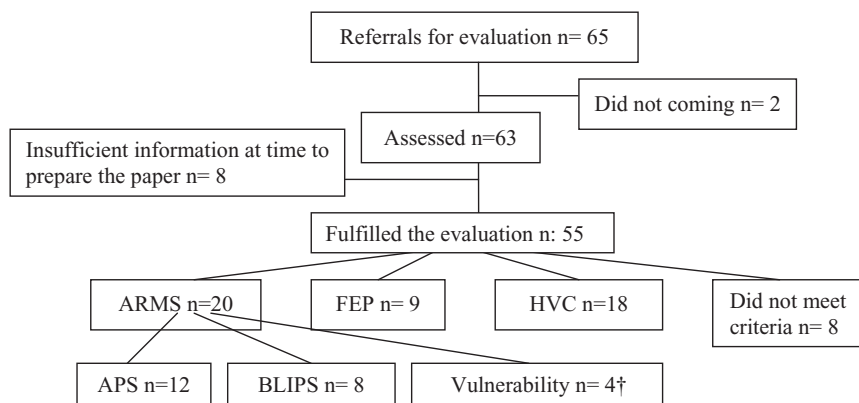


FIGURE 1. Numbers of referrals and evaluations of the team in the first year of functioning (ARMS, at-risk mental state; FEP, first episode of psychosis; HVC, highly vulnerable children; APS, attenuated positive symptoms; BLIPS, brief limited intermittent psychotic symptoms). †This group meet criteria for APS or BLIPS group.

TABLE 2. Socio-demographic characteristics of ARMS group

	ARMS group
Age, years: mean (IC)	15.8 (14.7–16.8)
Age range, years	12–20
Sex: (men : women)	12:8
Referrals source %	
Health	38.1
Education	33.3
Social services	28.6
Immigrants population %	20
Educational level %	
Primary	15
Secondary	80
University	5
Socio-economic level %	
Low-low	20
Low	20
Middle-low	20
Middle	25
Middle-high	15

ARMS, at-risk mental state.

dominance of the middle class. A minority were Latin-American immigrants.

Table 3 shows the baseline characteristics of the ARMS group. In the ARMS baseline, participants showed moderate difficulties in the GAF. They also showed negative symptoms and social impairment more frequently. In terms of intensity, negative symptoms were more severe than positive ones in the PANSS. In the SOPS's item 'Odd behaviour or appearance' the mean intensity was low to moderate.

DISCUSSION

One of the objectives of this study was to describe the performance of the ARMS/EMAR people's

TABLE 3. Baseline of at-risk mental state group

	ARMS
GAF: mean (IC)	50.8 (46.9–54.6)
ERlraos %	
Depressed mood	85
Reduction of motivation and poor work and school performance	80
Decrease in the ability to maintain or start social relationships.	70
Social withdrawal	55
Manic and dysphoric symptoms	30
Disturbed body functions	30
Suspiciousness / distrust	28.6
Feeling of slowing down, reduced energy and affect	23.8
Odd behaviour	23.8
Rumination (without inner resistance)	14.3
Depersonalization and derealization	14.3
Ideas of reference and paranoid symptoms	9.5
Preoccupation with mysterious things / unusual thought contents	4.8
(Pre-)psychotic thought disorders	4.8
Abnormal perceptions and hallucinations	4.8
PANSS mean (IC)	
Subscale positive	13.4 (11.3–15.5)
Subscale negative	15.8 (13.2–18.3)
Subscale general	35.6 (30.8–40.32)
SOPS mean (IC)	
SOPS positive	6.3 (4.6–8)
SOPS D1 (odd behaviour or appearance)	2.9 (2.24–3.56)

ARMS, at-risk mental state; ERlraos, Early recognition inventory: retrospective assessment of the onset and course of schizophrenia and others psychosis; GAF, global assessment functioning; PANSS, positive and negative symptoms scale; SOPS, scale of prodromal symptoms.

detection strategy in our team and the result of its application after its first year running.

The ARMS incidence is obviously determined by the selection criteria used by the clinical team. Nevertheless, the consideration of such data is mandatory in public health units, although the identification of this information in published

international studies poses a frequent challenge. Although it may seem that the ARMS incidence can be inferred from the transition rates to FEP and FEP incidence, the variability of the transition rates makes this impossible, even when similar strategies are used.²³ Our team estimated an incidence of 2.4 cases per year per 10 000 inhabitants, a higher incidence than other studies like the Cantabria's programme (Spain) on early psychosis, which detected one case per year per 10 000 inhabitants²⁴ using the criteria described by Yung *et al.*⁸ These differences may be attributable to differences in the age inclusion criteria (in our team: 12–56 years old; 14–30 with the UHR strategy), but in this 1-year study only a 10% of cases detected are between 12 and 14 years old and there are no patients over 30 years old.

Another possible explanation for these differences might be that in the Cantabrian and other international studies, the group referrals came from the sanitary sector, whereas in our study this proportion accounted for slightly more than a third of the referrals.

Evidence shows that health and mental health professionals who are aware about psychoses detect psychosis at early stages and tend to carry out appropriate referrals.^{25,26} Nevertheless, when awareness strategies extend to other sectors – such as education services – there is a higher DUP reduction.¹¹ In our study, the inclusion of social services professionals in the awareness strategy contributed to detect an additional third of cases, since individuals at risk of suffering from mental disorders are more likely to contact social services. Also, social services are more likely than health or education services to reach individuals with severe mental illness and social risk of isolation.²⁷

A considerable proportion (22 of 55) of individuals referred to the EAPPP met criteria for the ARMS group, to be added at nine FEP cases. This may be explained by the familiarity of the network with screening instruments as the ERiraos – which detects both negative and positive symptoms – and the expertise and formation of the staff. Because of that, and because the use of a screening instrument such as ERiraos might contribute to a higher accuracy of the referral process, completing the validation of the Spanish version of that instrument is a pressing issue.

Our results show that in our ARMS sample the four symptoms more frequent at baseline, as determined by the ERiraos, are negative symptoms and linked to social functioning impairment: depressed mood, reduction of motivation and poor work and school, decrease in the ability to maintain or start social relationships, and social withdrawal. These

results are consistent with those from other studies showing that depression and social functioning impairment were the more frequent reasons justifying initial visits.²⁸ They are also consistent with other studies showing that negative symptoms are dominant in the early stages of the prodromal phase.^{29,30}

Our sample highlights an ARMS high frequency of negative symptoms and social impairment, together with a relative youth age (mean 15 years) and dominance of APS symptoms. This particular syndrome might be due to the fact that we were detecting ARMS further in time from the first episode of psychosis. Indeed, this would be a key difference with the UHR strategy and would increase the potential for preventive interventions because of the lower risk of diagnostic error between ARMS and undiagnosed first episode of psychosis.³¹ On the other hand, this translates the problem into the possibility of a higher risk of 'false ARMS positives'.³²

Although negative symptoms are important, they are also both unspecific and frequently seen in other types of disorders. Because of that, as suggested by Simon *et al.*,³³ it seems sensible implementing a two-stage detection strategy, with one stage using broader criteria (ERiraos) in a community setting, and a second stage using more specific criteria (ARMS) in a specialized setting.

ARMS cases in our study did receive specialized care delivered under the EAPPP programmes, based in the integration of biological, psychological and psychosocial therapies with different approaches, in a combination of individual, family and group care.³⁴ Two of 20 first cases developed a first episode of psychosis in a period of 1 year.

It is important to stress the descriptive nature of our study. Because of it, our findings do not bear the comparison of two strategies or their absence in similar populations, as a quasi-experimental study would.

Future works will have to compare the relative performance of different detection strategies using a proper control group to further expand the results presented here. Also, further development is urgently needed of resources, techniques and procedures for the improvement of the integration of the work carried out from different settings: health, education and social services.

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