

Psychotic disorders among immigrants from Turkey in Western Europe: An overview of incidences, prevalence estimates, and admission rates



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SUMMARY

Objective: To provide an overview of incidence and prevalence estimates, admission rates, and related features of psychotic disorders among immigrants from Turkey in Western Europe.

Method: Articles published in all languages between 1990 and 2010 were included. In order to detect relevant studies, a string ([schizo*OR psych*] AND [Turk*] AND [migra* OR immigra*]) was used in MEDLINE and PsychINFO. Turkish indexes and abstracts books of national congresses were also screened to locate additional papers.

Results: We included 21 studies which yielded 25 rates on psychotic disorders among immigrants from Turkey. Fifteen papers reported rates for the immigrants from Turkey in The Netherlands, four for Germany, one for Denmark and one for Switzerland. The incidence estimates of non-affective and affective psychosis among immigrants from Turkey were between 38.5 and 44.9 per 100,000 while incidence estimates of schizophrenia were between 12.4 and 63.8 per 100,000. The prevalence estimates of schizophrenia and other psychotic disorders were between 1.1 and 6.2 per 1,000. Rates and relative risks of psychotic disorders in immigrants from Turkey tended to be higher than the natives and lower than other immigrant groups with similar sociocultural background. In addition to other risk factors, social contextual factors including discrimination and neighbourhood characteristics were the key environmental factors that modulate rates of psychotic disorders among immigrants from Turkey. Males were under a higher risk of incidence, prevalence estimates, and admission rates.

Conclusion: Variations in rates and relative risks indicate a possible etiological role of social experiences in immigrants. Studies with a focus on comparing the rates and the social factors of psychotic disorders between immigrants from Turkey in Western Europe and their family members residing in Turkey may provide additional insight into the epidemiology of psychotic disorders.

Key words: Schizophrenia, psychosis, epidemiology, migration, Turkey

Introduction

High rates of schizophrenia and other psychoses have been repeatedly found in different migrant populations (Cantor-Graae and Selten 2005). There are well-established and validated reports in the literature of an increased incidence of schizophrenic disorders among first- and second-generation Afro-Caribbean immigrants to the United Kingdom and Moroccan-Surinamese immigrants to the Netherlands (Kirkbride et al. 2006, Veling et al. 2006). A meta-analysis of

incidence studies found a mean (weighted) relative risk of 2.7 and 4.5 for the first and the second generations respectively (Cantor-Graae and Selten 2005). A subgroup comparison pointed out a greater risk for migrants from developing countries and for migrants from countries where the majority of the population is black.

The selective immigration hypothesis, which points out the higher rates among immigrants as a result of higher migration rate of individuals with a predisposition for psycho-

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ses, has dominated the explanations of the epidemiological findings for decades; however, the recent findings have drawn attention back to psychosocial environmental factors (Cantor-Graae and Selten 2005). The novel reports and risk differences between immigrant groups have provided compelling evidence for psychosocial factors in aetiology (Binbay et al. 2007, Cooper 2005, Morgan et al. 2010).

Some possible explanations for the higher rates among immigrants include stress related to migration and acculturation processes, a negative experience of racism and discrimination, service utilization patterns, psychoactive substance use, social disadvantaged status, and specific biological causes (Morgan et al. 2010, Sharpley et al. 2001). In addition, the possibility of misdiagnosis and inaccurate population denominators were suggested as a criticism for the excess of psychotic disorders in migrant groups (Selten and Hoek 2008).

Environmental factors may have an impact as a source of psychosocial stress (Cantor-Graae and Selten 2005). It has been proposed that the long-term experience of social defeat, defined as a subordinate position or as an outsider status, may well be the common denominator for these findings (Cantor-Graae and Selten 2005, Selten and Cantor-Graae 2007). A particular psychosocial stress varies between ethnic profiles of neighbourhood populations. The incidence of psychotic disorders in minority ethnic groups is higher when they comprise a smaller proportion of the local population (Boydell et al. 2001, Kirkbride et al. 2007, Veling et al. 2008b). The so called “ethnic density” effect has turned the attention to the possible role of the social context in which ethnic minorities reside (Allardyce ve Boydell 2006).

The interaction of environmental and genetic factors may form psychological or physiological alterations that can lead to a sensitization which is the final common pathway of cognitive biases and/or altered dopamine neurotransmission (Collip et al. 2008). A chronic and long-term experience of social defeat may lead to a sensitization of the mesolimbic dopamine system and thereby increase the risk for schizophrenia (Selten and Cantor-Graae 2007). The migration related epigenetic interactions (changes produced in gene expression caused by mechanisms other than changes in the underlying DNA sequence, eg. DNA methylation) may facilitate the onset and persistence of psychotic-like experiences which increases the mean level of psychosis and ultimately lead to higher rates of psychoses among immigrants in accordance with the psychosis continuum (van Os et al. 2009).

A broad spectrum of ethnic groups is affected, but there is considerable heterogeneity across groups. Besides variation of rates, some migrant groups, which tend to have similar social, cultural and economic properties including their family structure, migration pattern, acculturation pattern, religion, education level, unemployment rate, have different outcomes

in the sense of psychotic disorders. Cantor-Graae and Selten (2005) noted that a higher relative risk for schizophrenia has not been found among Turkish migrants to the Netherlands versus native-born persons. The relative low rate of psychoses was in some part explained by strong social and family networks (Selten and Cantor-Graae 2007).

The bias due to low publication of randomized controlled trials with an insignificant outcome is well known (Ulaş et al. 2008). Epidemiological researchers may also prefer to emphasize the estimates and factors with high risk ratios (Pocock et al. 2004). But this may lead to misinterpretation of the data and relevant risk factors. The repeated relatively low risk of psychoses among immigrants from Turkey may be an example of the underestimation of protective factors in psychoses. Thus it is important to ask why ethnic groups differ in their risks for particular psychiatric disorders (Selten and Hoek 2008).

Our aims for this review were:

1. To overview the incidence and prevalence rates among the immigrants from Turkey on epidemiological studies in Western Europe;
2. To compare the rate of psychotic disorders among the immigrants from Turkey with the eligible estimates in Turkey;
3. To compare the illness features and the possible risk factors for psychotic disorders between immigrants from Turkey and native residents in Turkey;
4. To evaluate the possible explanations for lower or higher risk of psychoses among immigrants from Turkey.

Methods

Identification of studies

We performed a relevant literature search on different databases. At first, a broad search combination ([schizo*OR psych*] AND [Turk*] AND [migra* OR immigra*]) was used in MEDLINE and PsychINFO for relevant papers published in any language. Additional searches were performed with a string of ([şizofreni OR psikoz] AND [epidemioloji OR yaygınlık]) on Turkish Medical Index and Turkish Psychiatry Index. Relevant presentations in three annual national congresses (National, Social Psychiatry and Anatolia) were searched via the abstract books. We also scanned relevant theses on the national database supplied by The Turkish Council of Higher Education. The references cited by each potentially relevant paper, review, and book chapter were scrutinized in order to locate additional potential papers. Relevant papers were screened for potentially relevant information.

Inclusion and exclusion of studies

We included two groups of studies: (i) Studies that reported primary data on the prevalence and/or incidence estimates

of psychotic disorders after 1990 among immigrants from Turkey; (ii) studies that reported the inpatient admission rates of psychotic disorders among immigrants from Turkey. Where multiple publications presented relevant identical data, all were included due to the low number of available studies. Studies having insufficient data, overlapping samples, no prevalence results or studies with an outsider epoch were excluded after a contact with the first author when needed. Some of the studies were lacking detailed information while were still presenting only basic rates (e.g admission rate). Since the number of papers was few, instead of excluding these studies we included their data for the relevant parts of the analysis.

Data extraction and evaluation

The prevalence, incidence and admission estimates were calculated from studies by numerators (number of cases) and denominators (number of immigrants from Turkey) when both were provided. *Point prevalence* is a measure of the proportion of people in a population who have a disease or condition at a particular time, such as a particular date (eg. 20.12.2010). It is like a snap shot of the disease in time. This is in contrast to *period prevalence* which is a measure of the proportion of people in a population who have a disease or condition over a specific period of time, say a season, or a year (Saha et al. 2005). Thus period prevalence may cover a lifetime or one year prevalence estimate. The *incidence rate* is the number of new cases per unit of person-time at risk in a particular population. The *first admission rate*, which only covers new cases in a defined catchment area, may also provide incidence rate. However it differs from incidence rate since it only covers cases admitted to a particular institution (McGrath et al. 2004). Using person-time rather than just time handles situations where the amount of observation time differs between people, or when the population at risk varies with time. *Admission rate* is the number of outpatient or inpatient cases from any stage of the disease admitted for the first time in a particular population at risk.

Our review presents all eligible data on prevalence estimates (point, one year, period or lifetime), rate of psychotic patients among inpatient admissions, population based admission rates, and incidence rates from the first admission studies in separate tables. Estimates were calculated by division of all immigrant cases from Turkey (numerator) by the total population of immigrants from Turkey (denominator). The most commonly reported variable was gender rates. A male-female ratio was calculated by dividing the admission or contact rate of psychotic disorders among males by that of females. The discussion section included the possible explanation of the results with various relevant hypotheses (Morgan et al. 2010, Sharpley et al. 2001).

Results

After reading abstracts on each study from the electronic searches on international databases (n: 1327), we identified 17 potential papers. Search on the electronic and other resources in the Turkish databases identified 138 papers however none of those papers included data on prevalence, incidence estimates nor admission rates. After detection of additional studies via the references of the papers identified on international databases, our final evaluation included 21 studies which yielded 25 rates on psychotic disorders among immigrants from Turkey (de Wit et al. 2010, Dekker et al. 1996, Haasen et al. 1998, Holzmann et al. 1994, Kamperman et al. 2005, Koch et al. 2008, Lay et al. 2005, Mortensen et al. 1997, Mulder et al. 2006, Schrier et al. 2005, Schrier et al. 2001, Selten 2002, Selten et al. 2011, Selten ve Sijben 1994, Selten et al. 2003, Selten et al. 2001, Vanheusden et al. 2008, Veling et al. 2006, Veling et al. 2007b, Weyerer ve Hafner 1992, Wittkamp et al. 2010).

Fifteen of the papers reported rates or conclusions for the migrants in the Netherlands, four for Germany, one for Denmark and one for Switzerland. Fifteen papers were in English, four were in Dutch and two were in German.

Seven papers were cross-sectional surveys with prevalence estimates (Table 1). Four were inpatient admission studies comparing admission rates among different immigrant groups to natives in particular institutions (Table 2). One of the inpatient admission studies provided the population denominator for calculation of prevalence (Lay et al. 2005). Four were register based first admission studies, one of which yielded two different rates (Table 3). Six first contact incidence studies reported 8 different rates (Table 4). All rates were for first generation migrants unless otherwise indicated.

The prevalence estimates of psychotic disorders were between 1.1 and 6.2 per 1000, and all rates were reported for the migrants in the Netherlands except one for the migrants in Switzerland (table 1). The prevalence estimates of immigrants from Turkey were lower than other immigrant groups except the Western European migrants and were similar to or higher than the rates in native Dutch or Swiss. Prevalence estimates of psychotic disorders in immigrants from Turkey tended to be higher in males than females. The one year prevalence rate of antipsychotic prescriptions was 20.7 per 1000 among immigrants from Turkey (Wittkamp et al. 2010). Two studies (Selten 2002, Lay et al. 2005) provided total population of immigrants from Turkey and prevalence estimates of inpatients with any psychotic disorders were 1.1 and 2.2 per 1000 respectively. The prevalence of psychotic-like experiences (visual or auditory hallucinations) was 15.8 per 100 and rates were only higher in female immigrants from Turkey when compared with female natives and females from other ethnic groups (Vanheusden et al. 2008).

Table 1. Cross sectional studies with a result on immigrants from Turkey

Country, city, reference	Method	Result ¹	Notes on rates ²
The Netherlands, Rotterdam (Schrier et al. 2001)	Treated point prevalence at outpatient services on October 1, 1994; DSM-III-R schizophrenia; 20-64 years	1.1	In males, lower than other immigrant males and similar to native Dutch males In females, lower than other immigrant females except Moroccan and similar to native Dutch females
The Netherlands, Amsterdam (Schrier et al. 2005)	Treated point prevalence at outpatient services; psychotic disorders; November 1, 2001; 23-59 years	2.8	Lower than other immigrant groups (Surinamese and Moroccan) and native Dutch nationalities
The Netherlands, Amsterdam (Kamperman et al. 2005)	Lifetime prevalence in a cross-sectional survey with CIDI 1.1; DSM-III-R psychotic disorders; 18-65 years	6.2	Lower than other immigrant group (Surinamese) Male-female ratio: 0.89
The Netherlands, Amsterdam (Wittkamp et al. 2010)	One year prevalence; any antipsychotic prescriptions in 2006 on patient register database; all age groups	20.7	Similar to other immigrant groups and higher than native Dutch nationalities
The Netherlands, Utrecht (Selten et al. 2011)	One year prevalence; any admission in 2006 on patient register database; DSM-IV schizophrenia and other psychotic disorders; 15-65 years	5.0	Lower than other immigrant groups, and similar to native Dutch nationalities and immigrants from other West European countries Male-female ratio: 2.75
The Netherlands, whole country (Selten 2002)	Period prevalence; any inpatient admission between 1978 and 1996 on patient register database; ICD-8 and 9 schizophrenia; age NS*	2.2	Lower than other immigrant groups Male-female ratio: 2.29
Switzerland, Canton of Zurich Kantonu (Lay et al. 2005)	Period prevalence; any inpatient admission between 1995 and 2001 on patient register database; ICD-10 psychotic disorders; 18-65 years	1.1	Lower than other immigrant groups and native Swiss nationalities
The Netherlands, South-West part of the country (Vanheusden et al. 2008)	Period prevalence; self-report visual and auditory hallucinations screened with ASR (Adult Self-Report); 19-30 years	15.8 ³	Higher than other immigrant groups and natives, but only in females

¹Rates per 1000 persons; ²On reported odds ratios or relative risk ratios; ³Per 100 persons. *NS: Not specified

Table 2. Rate of psychotic disorders in inpatient admission studies with a result on immigrants from Turkey

Country, city, reference	Method	Result	Notes on rates
Germany, Frankfurt (Holzmann et al. 1994)	Case register data; inpatient admissions in 1992; paranoid schizophrenia; age NS*	NS*	Higher rates in all immigrant groups than native German, including immigrants from Turkey
Germany, Hamburg (Haasen et al. 1998)	Case register data; inpatient admissions in 1993-1995; ICD-10 psychotic disorders; age NS*	%49.4 (40/81 of immigrant patients from Turkey)	Higher rates in all immigrant groups than native German, including immigrants from Turkey Male dominance in rates
Switzerland, Canton of Zurich (Lay et al. 2005)	Case register note; inpatient admission between 1995-2001; ICD-10; 18-65 years	%19.6 (89/453 of immigrant patients from Turkey)	Lower than other immigrant groups and native Swiss Male dominance
Germany, 12 inpatient clinic (Koch et al. 2008)	Case register note; inpatient admission on 21.01.2004; ICD-10 psychotic disorders; +18	%33.3 (38/114 of immigrant patients from Turkey)	Higher than immigrants from East Europe and native German

The rate of psychotic disorders in any psychiatric inpatient admissions among immigrants from Turkey was between 19.6 and 49.4 per 100 admissions (table 2). Rates among immigrants from Turkey were higher than the rates in natives and other immigrant groups in all papers from Germany. The rate of psychotic disorders in all inpatient admissions tended to be higher in males than females.

The admission rates of psychotic disorders among immigrants from Turkey were between 26.1 and 75.6 per 100,000 in four

first admission studies (table 3). Rates were reported for the admissions in inpatient and emergency services, and compulsory admissions. The admission rates of psychotic disorders in immigrants from Turkey tended to be lower than other immigrant groups in the Netherlands, native Germans and Danes. However the rate of acute compulsory admission among second generation immigrants from Turkey was markedly higher than first generation immigrants (de Wit et al. 2010). Also the rate of acute compulsory admission was higher in males than females in both generations (de Wit et al. 2010).

Table 3. First admission studies with a result on immigrants from Turkey

Country, city, reference	Method	Result ¹	Notes on rates
Germany, Mannheim (Weyerer and Hafner 1992)	Case register data; first admission in 1974-1980; ICD-8 schizophrenia; age NS*	NS*	Lower in all immigrant groups than native German, including immigrants from Turkey
Denmark, whole country (Mortensen et al. 1997)	Case register data; first admission in inpatient units in 1980-1992; ICD-8 schizophrenia; age NS*	NS*	Lower than other immigrant groups and similar to native Danish
The Netherlands, Rotterdam (Mulder et al. 2006)	Case register note; first contact with emergency service in 2001; clinical interview for psychotic disorders; 18-65 years	52.5 ^a	Lower than other immigrant groups Higher than natives and West European immigrants
Hollanda, Amsterdam (de Wit et al. 2010)	Case register data; first admission to acute compulsory inpatient services in 1996-2005; DSM-IV schizophrenia and other psychotic disorders; +18 years (1st generation)	26.1 ^a 35.0 ^b 15.9 ^c	Lower than other immigrant groups and similar to native Dutch Male-female ratio: 2.20
Hollanda, Amsterdam (de Wit et al. 2010)	Case register data; first admission to acute compulsory inpatient services in 1996-2005; DSM-IV schizophrenia and other psychotic disorders; +18 years (2nd generation)	75.6 ^a 122.5 ^b 22.9 ^c	Lower than other immigrant groups Higher than natives and West European immigrants Male-female ratio: 5.35

¹Rates per 100.000 persons; ^aTotal, ^bmales, ^cfemales. * NS: Not specified

All papers on first admission incidence reported rates for the immigrants in the Netherlands. Incidence rates of psychotic disorders (DSM-IV schizophrenia and other psychotic disorders) and schizophrenic disorders (DSM-IV schizophrenia, schizophreniform and schizoaffective disorders) were between 38.5 to 44.9 and 12.4 to 63.8 per 100,000 among immigrants from Turkey, respectively (table 4). Incidence of bipolar disorder with psychotic features was 6.8 per 100,000 while incidence of depressive disorder with psychotic features

was 13.4 per 100,000. First admission incidences were almost four-folds higher among the second generation immigrants than the first generations. Incidence rates of affective and non-affective psychotic disorders were two to six-folds higher in males than females. Incidence rates among immigrants from Turkey were higher than native Netherlands and western European immigrants, especially the rates in the second generations. However incidence rates were lower than the rates among immigrants from Morocco and Surinam. Incidence of

Table 4. First contact incidence studies with a result on immigrants from Turkey

Country, city, reference	Method	Result ¹	Notes on rates ²
The Netherlands, whole country (Selten and Sijben 1994)	Case register data; first admission in 1990; ICD-9 schizophrenia; +15 years	12.4 ^a 21.5 ^b 5.5 ^c	Lower than other immigrant groups and similar to native Dutch
The Netherlands, Amsterdam (Dekker et al. 1996)	Case register data; first admission in 1992-1993; ICD-9 schizophrenia; 18-39 years	13.0 ^b 10.0 ^c	Lower than other immigrant groups and native Dutch
The Netherlands, Den Haag (Selten et al. 2001)	First admission in a defined catchment area in 1997-1999; DSM-IV psychotic disorders ³ ; 15-54 years (1 st generation)	38.5 ^a 60.3 ^b 9.1 ^c	Lower than other immigrant groups Higher than natives and West European immigrants
The Netherlands, whole country (Selten et al. 2003)	Case register data; first admission in inpatient units in 1990-1996; ICD- 9 manic-depressive psychosis (bipolar type); 15-54 years	6.8 ^a 8.4 ^b 4.8 ^c	Lower than other immigrant groups and native Dutch in males Lower than other immigrant groups and native Dutch except immigrants from Morocco in females
The Netherlands, whole country (Selten et al. 2003)	Case register data; first admission in inpatient units in 1990-1996; ICD- 9 manic-depressive psychosis (depressive type); 15-54 years	13.4 ^a 14.4 ^b 12.2 ^c	Higher than other immigrant groups and native Dutch except immigrants from Morocco in males Lower than native Dutch and similar to other immigrant groups in females
The Netherlands, Den Haag (Veling et al. 2006)	First admission in a defined catchment area in 1997-1999 and 2000-2002; DSM-IV schizophrenic disorders ⁴ ; 15-54 years (1 st generation)	20.8 ^a 27.4 ^b 12.7 ^c	Lower than other immigrant groups, higher than natives and West European immigrants in males Higher than native Dutch and similar to other immigrant groups in females
The Netherlands, Den Haag (Veling et al. 2006)	First admission in a defined catchment area in 1997-1999 and 2000-2002; DSM-IV schizophrenic disorders ⁴ ; 15-54 years (2 nd generation)	63.8 ^a 84.7 ^b 42.7 ^c	Higher than natives, West European immigrants and immigrants from Antilles; lower than other immigrant groups
The Netherlands, Den Haag (Veling et al. 2007b)	First admission in a defined catchment area in 1997-1999 and 2000-2005; DSM-IV psychotic disorders ³ and schizophrenic disorders ⁴ ; 15-54 years (1 st and 2 nd generations)	44.92 30.23	Higher than natives and West European immigrants; lower than other immigrant groups

¹Rates per 100.000 persons; ²on reported odds ratios or relative risk ratios; ³Psychotic disorders: DSM-IV categories of schizophrenia, schizophreniform disorder, schizoaffective disorder, mood disorder with psychotic features, delusional disorder, brief psychotic disorder, shared psychotic disorder or psychotic disorder not otherwise specified; ⁴Schizophrenic disorders: DSM-IV categories of Schizophrenia, schizophreniform disorder, schizoaffective disorder.

^aTotal, ^bmales, ^cfemales.

depressive disorder with psychotic features was higher than other immigrant groups and native Netherlands except immigrants from Morocco.

Risk ratios of psychotic disorders were lower among immigrants from Turkey than other immigrant groups in 16 of 21 papers. Risk ratios of hallucinations were higher than all other ethnic groups in female immigrants from Turkey. Also risk of a depressive disorder with psychotic features was higher than other immigrant groups and native Netherlands in male immigrants from Turkey. In six reports, risk ratios of psychotic disorders were lower among immigrants from Turkey than natives while risk was higher than natives in 11 reports. Six studies reported similar risk ratios compared to natives. Risk ratios for immigrants from Turkey were higher in reports on second generation immigrants and on compulsory admission than studies on first admission and other type of studies.

Discussion

Reported prevalence estimates, incidence and admission rates of our review have important findings on psychotic disorders among immigrants from Turkey as well as the general population in Turkey. Since there is no available data on the incidence of psychotic disorders in Turkey, incidence rates of immigrant studies may provide proxy rates of psychotic disorders in Turkey. The main finding of our review is that the rates of psychotic disorders in immigrants from Turkey tend to be lower than other immigrant groups with similar socio-cultural background in all levels of measurements including prevalence, incidence and admission rates. The rate of psychotic disorders in immigrants from Turkey is comparable to or higher than natives and Western European immigrants, however the risk was lower than other immigrant groups. Male immigrants and second generation immigrants had a high risk of experiencing a psychotic disorder. There is no comparable data from Turkey regarding incidence and admission rates of psychotic disorders.

Prevalence estimates of psychotic disorders among immigrants from Turkey were lower than lifetime prevalence of schizophrenia (Binbay et al. 2011b) and lifetime prevalence of any psychotic disorders (Binbay et al. 2011a) in the general population of Turkey. The inpatient admission rate of psychotic disorders in immigrants from Turkey is similar to the median rate of inpatient admission rate of psychotic disorders in Turkey (Binbay et al. 2011b).

Thus, an overview and comparison of hypotheses in psychoses epidemiology is needed to explain why the rates of psychotic disorders in immigrants from Turkey tend to be higher than natives and lower than other immigrant groups. The results may be biased as the majority of the studies and all of the prevalence and incidence reports were from the Netherlands,

and may be specific for the immigrant population resident in the Netherlands.

In Germany, where the main migrant population group is from Turkey, there has been little research effort on ethnic differences in psychopathology in schizophrenia, even though Turkish schizophrenics have been shown to be over-represented in clinical settings (Haasen et al. 1997). The lacking information of an accurate population denominator has hampered the efforts to confirm the observations in Germany (Hutchinson and Haasen 2004).

Besides methodological restrictions in the countries where rates on psychotic disorders were reported, our findings might have several implications for the hypothesis on the higher rates of psychotic disorders among immigrants. Therefore we will discuss our main result (higher rates of psychotic disorders in immigrants from Turkey than natives and lower rates of psychotic disorders than other immigrants) depending on the various hypotheses about immigrants proposed on psychosis epidemiology.

Misdiagnosis and methodological concerns

One important claim, which has hindered the results, is a misdiagnosis artifact that leads to pseudo-high rates among immigrants (Cantor-Graae and Selten 2005). According to this claim, the usage of culturally insensitive questionnaires, misunderstanding of local cultural attitudes during clinical evaluation or language based difficulties lead to false interpretation of complaints as psychotic symptoms. So misdiagnosis is the main reason of high rates among immigrants. In order to provide evidence in support of this notion several diagnostic comparison studies where immigrant patients were evaluated by two different clinicians (one from his or her native population, one from immigrant population) were conducted (Hickling et al. 1999, Minnis et al. 2001, Zandi et al. 2008). There are repeated reports on a decrease of high rates of psychotic disorders after evaluations with culturally sensitive questionnaires or interviews (Haasen et al. 2000, Zandi et al. 2008). On the other hand clarification of final diagnosis after interviews with close relatives and after review of all case notes by clinicians involved in the study may decrease the probability of misdiagnosis (Selten et al. 2010).

However a higher probability of misdiagnosis was reported among immigrant patients from Turkey and furthermore one in seven patients from Turkey with paranoid auditory hallucinations may be misdiagnosed with schizophrenia in Germany (Haasen et al. 2000). Although misdiagnosis was not limited to schizophrenia, the probability of a schizophrenia misdiagnosis was five-folds higher in immigrants from Turkey than native Germans (Haasen et al. 2000).

Another way of dealing with the diagnostic bias is to conduct a follow-up study of first episode psychotic patients. Diagnostic

stability was reported when immigrant patients from Turkey were followed-up for three years and most of them were diagnosed with schizophrenia at the end of follow-up (Veen et al. 2004). However results ought to be interpreted with caution since higher rates of affective symptoms, particularly more depressive symptoms were reported among patients from Turkey than native patients (Haasen et al. 2001, Veen et al. 2004). Higher rates of depressive symptomatology in immigrant psychotic patients were also reported for Afro-Caribbeans in United Kingdom and for Moroccans in the Netherlands (Sharpley et al. 2001, Veling et al. 2007a). On the other hand higher rates of depressive symptoms in immigrant patients may not point out a misdiagnosis but under interpretation of depressive episodes in immigrant patients (Haasen et al. 2001). It is also noteworthy that psychotic symptom severity in immigrant first-episode patients from Turkey was lower than other ethnic groups (Veling et al. 2007a).

In immigrants from Turkey, the first admission rates of affective psychosis were similar to the first admission rates of non-affective psychosis in the reports from the Netherlands (Selten and Sijben 1994, Selten et al. 2003). However the first admission rates of non-affective psychosis were reported to be 2-3 folds higher than the rates of depressive psychosis in the later studies (Veling et al. 2008b). Moreover a relatively lower number of new cases of affective psychosis is noteworthy in the Den Haag study (Veling et al. 2008b). Therefore, there may be a diagnostic bias among immigrant patients from Turkey where depressive psychosis is misdiagnosed as schizophrenia.

Dissociative experiences and symptoms can be another confounding diagnostic classification for the immigrant patients from Turkey, which may be evaluated as psychotic experiences (Şar and Ross 2006). Psychotic symptoms can be observed in dissociative disorders including dissociative identity disorder and dissociative disorder not otherwise specified. Patients may experience delusions and even Schneiderian symptoms which are clinically dissociative in nature (Şar and Öztürk 2008). Several patients can admit with a clinical picture of dissociative symptoms that have an acute onset after a life event or trauma, female dominancy, rapid recovery even in one month, and no family history of mental disorders. Such patients can be misdiagnosed with a psychotic disorder, even with schizophrenia (Şar and Öztürk 2008).

Moreover antipsychotic prescriptions are higher in immigrant groups than natives and thus the prevalence of antipsychotic medication is reported higher in immigrant groups than the natives in the Netherlands (Wittkamp et al. 2010). However relative high rates of psychotic disorders and subclinical experiences in ethnic groups are still needed to explain as such disorders are conceptualized in a spectrum rather than categories. Thus diagnostic bias can only explain a small fraction of the relative high incidence and prevalence rates of schizophrenia in immigrant groups.

Selective migration and genetic liability

High rates of psychotic disorders were attributed to subtle genetic characteristics which disturb adaptation of prodromal individuals to their own ethnic group, lead to migration and as a consequence higher rates of schizophrenia in the migrated country (Cantor-Graae and Selten 2005, Selten et al. 2002). The selective migration hypothesis argues migration as a non-random process which is a consequence of a genetic liability that psychotic disorders also emerge from.

Studies comparing rates of schizophrenia in the native-born population of motherland, in the native-born population of migrated country, and in the migrated population has provided empirical findings against selective migration. Although incidence of first episode psychotic disorder in Suriname is similar to that in the native-born population of the Netherlands, Surinamese migrants to the Netherlands have a five-fold higher incidence rate than the native-born population in Surinam where more than one-third of the population emigrated (Selten et al. 2002). Moreover, selective migration hypothesis is unable to explain the increased risk for schizophrenia found among second-generation migrants (Cantor-Graae ve Selten 2005).

On the other hand there is little study on geographical and familial aspects of migration from Turkey to Western Europe (Böcker 2000). Guided migration by a relative or another person from local residency (county, village, neighbourhood) in Turkey has a major role in employment migrations to Western Europe (Böcker 2000). There are still examples of guided migrations where the majority of the village or neighbourhood migrates to the same country or city in Western Europe (eg. from Afyon-Emirdağ to Belgium, from Konya-Kulu to Sweden). Such influences can lead to a confounding genetic liability or migration of clustered cases within a family. Thus further research on selective migration from Turkey and incidence of psychotic disorders in the migrated population and native-born population in Turkey is needed.

Protective or risk factors of social environment

The most striking findings on lower risk of psychotic disorders among immigrants from Turkey than other immigrant groups were reported in studies on aspects of social environment where migrants reside. Three aspects of social environment were associated with an incidence of schizophrenia. Ethnic density of neighbourhoods is associated with risk of psychotic disorders. The relatively higher incidence of schizophrenia is repeatedly reported in immigrant groups that represent smaller proportions of the local population (Boydell et al. 2001, Kirkbride et al. 2007, Veling et al. 2008b). Known as “ethnic density effect”, the risk of psychosis is decreased or buffered in neighbourhoods where ethnic minorities reside together. On the other hand migrants who are residents in

neighbourhoods where their ethnic group represents smaller proportions of the local population, may be exposed to more social adversity and have less social support thus increasing disadvantages.

Secondly there is a variation the incidence of schizophrenia, which seems to be associated with the level of perceived discrimination based on ethnic group, skin colour or race (Sharpley et al. 2001). Incidence rates are higher in immigrant groups reporting higher perceived discrimination (Reininghaus et al. 2010, Veling et al. 2007b). Interestingly personal perception of discrimination and formal applications for discrimination were the lowest in immigrants from Turkey in the Netherlands (Veling et al. 2007b) and Sweden (Bayard-Burfield et al. 2001).

There is an association between incidence of schizophrenia and weak and negative identification with one's own ethnic group (Veling et al. 2010). Thus, difficulties in acculturation, experiences of social defeat, perceptions of discrimination, marginalization, and weak ethnic identity seems to be contributing social risk factors for schizophrenia where intra-group solidarity of immigrants, wide adaptation opportunities of local neighbourhood, and regular family life may be part of a protective factor in schizophrenia. A relatively lower risk of psychotic disorders in immigrants from Turkey can be associated with protective or buffering effects of intragroup and/or intrafamily relationships on the social stress associated with migration (Cantor-Graae ve Selten 2005).

The urban upbringing and residency are major environmental risk factors in schizophrenia. The majority of immigrants are residents of metropolitan cities of Western Europe with high exposures to urban life. Although place of birth and upbringing of first generation immigrants from Turkey were usually rural areas of Turkey, second generation immigrants live in big cities of Western Europe. Differences in residency patterns across generations can be one of the factors that increase the risk of psychotic disorders in second generation immigrants.

Social adversities and disadvantages

Immigrants are exposed to multiple social adversities including unemployment, low income, problems of accommodation, low social support which potentially increase rates of psychotic disorders in these groups (Morgan et al. 2010). Social adversities and disadvantages which accumulate through early stages of life act as a risk factor for psychotic disorders (Morgan et al. 2010). Immigrants from Turkey have lower education and income, and 4-5 folds higher unemploy-

ment than natives of the Netherlands (Selten ve Sijben 1994). Moreover, immigrants from Turkey are exposed to more social disadvantages than immigrants from Surinam and Morocco in the Netherlands (Selten et al. 2001). However they have lower rates and risk of psychotic disorders in The Netherlands than other immigrant groups.

Psychoactive substance abuse

Psychoactive substances particularly cannabis abuse increases the risk of schizophrenia (Henquet et al. 2005). The relatively higher risk of psychotic disorders in immigrants can be associated with higher substance abuse. However substance abuse in immigrant patients from Turkey was not higher than native patients and patients from other immigrant groups in the Netherlands (Veen et al. 2002, Veling et al. 2008a). Also admission for alcohol and substance abuse disorders is lower in immigrants from Turkey than other immigrant groups in the Netherlands (Veen et al. 2002). Moreover first admission rates of substance abuse disorders is lower in immigrants from Turkey than natives and other immigrant groups in the Netherlands (Selten et al. 2007). On the other hand substance abuse is higher in immigrant patients from Turkey than psychotic patients in Turkey (Akvardar et al. 2004). Thus psychoactive substance abuse may be a minor contributing factor for higher rates of psychotic disorders in immigrants from Turkey than natives in the Netherlands. On the other hand, the relatively lower rates of substance abuse may contribute to lower rates of psychotic disorders immigrants from Turkey than other immigrant groups in the Netherlands.

Conclusion

The rates of psychotic disorders in immigrants from Turkey tend to be higher than natives of the Netherlands, Germany, Switzerland and Denmark. On the other hand rates in immigrants from Turkey tend to be lower than other immigrant groups with similar sociocultural background including income, educational level, and socioeconomic status. Moreover risk ratios of psychotic disorders in immigrants from Turkey were not as high as other immigrant groups. Uncertain social and intragroup characteristics of immigrants from Turkey probably buffer the risk effect of migration related factors on psychotic disorders. Further research with a focus on a comparison of rates and risk factors of psychotic disorders between immigrants from Turkey and their relatives or members of their extended family in Turkey is one possible way to provide more detailed information on the epidemiology of psychotic disorders in immigrant groups.

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