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Does specialization of treatment influence mortality in eating disorders? – A comparison of two retrospective cohorts

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ABSTRACT

Eating disorders (EDs) are psychiatric disorders associated with high morbidity and mortality. It is well established that patients with anorexia nervosa (AN) have an increased risk of premature death, whereas mortality data are lacking for the other EDs. This study aimed to establish mortality rates in a sample of ED patients ($n=998$) with a mean follow-up of 12 years. This was compared to previous data from the same catchment area before a multidisciplinary centre was established. The standardized mortality ratio (SMR) was calculated. To compare the two cohorts, adjusted crude ratios were calculated with the confounding variables: body mass index (BMI), age at referral and diagnosis. In the latest cohort the SMR for AN was 2.89 vs 11.16 in the time before our specialization. SMR for bulimia nervosa (BN) and for eating disorder not otherwise specified (EDNOS) in the latest cohort were 2.37 and 1.14 respectively. When comparing two retrospective cohorts it is not possible to draw a definite conclusion, however the present study supports that integrating a somatic unit in a multidisciplinary centre may have a favourable influence on mortality in AN.

1. Introduction

Eating disorders (ED) are associated with high morbidity and anorexia nervosa (AN) demonstrate the highest mortality rate of any psychiatric disorder (Erdur et al., 2012). The prognosis remains poor with only approximately half of the patients recovering (Steinhausen, 2002). Established predictors for poor outcome and mortality include psychiatric comorbidity, purging behaviour and higher age at debut (Lowe et al., 2001).

It has been reported that one in five deaths in AN is caused by suicide, most commonly by self-poisoning, followed by hanging, alcohol and drowning, with approximately two-thirds dying from natural causes and the rest from accidents, homicides or unspecified causes according to death certificates (Emborg, 1999). However, the validity of mortality statistics based on death certificates has limitations in terms of accuracy as the studies rely on second-hand reported data. An audit conducted in the UK revealed an over- and underreporting of AN as a cause of death (Muir and Palmer, 2004), which confirms that data relying on this source of information has its limitations.

Most studies conclude that the standardized mortality ratio (SMR) is increased for EDs with one study documenting an increase as high as 17.8 times the expected (Norring and Sohlberg, 1993), however other studies found no increase in mortality in AN compared to the expected (Halvorsen et al., 2004).

A meta-analysis examining the SMR in EDs has been published taking into account the variations in study design (Arcelus et al., 2011). The meta-analysis came out with an average SMR of 5.9 in AN, 1.9 in bulimia nervosa (BN) and 1.9 in eating disorder not otherwise specified (EDNOS). This analysis confirmed previous findings of higher age at debut as a significant predictor for mortality in AN. Length in follow-up time also seem to impact the SMR, e.g. a 10 year follow up study revealed a SMR of 9.6 (Nielsen et al., 1998) opposed to a follow-up time of 22 years with a corresponding SMR of 2.76 (Crisp et al., 1992), but these findings are not consistent with a 20 year follow-up which found a SMR of 10.5 (Birmingham et al., 2005). Studies focusing on poor outcome, including mortality, have deemed low BMI as a significant indicator of poor prognosis (NICE, 2004). Rosling et al. (2011) examined the impact BMI has on mortality in a study including AN and BN patients. The study found that SMR increased significantly to extremely high levels when BMI fell below 11.5. The results also revealed that, although the SMRs of the BMI groups >11.5 were moderately elevated; they were not significantly different from the SMR of the patients with BMI ≥ 17.5. The authors propose a risk

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stratification of AN according to BMI due to the correlation between BMI and prognosis (Rosling et al., 2011).

The heterogeneity of the cohorts, in terms of treatment received, complicates comparisons. Population-based studies include patients who are, most likely, not as ill as patients in studies performed on a tertiary care level. Under this assumption one would expect lower SMRs in population-based studies. However, a comprehensive study from 1992 found a lower SMR in a cohort treated at a tertiary care level facility compared to primary care level (Crisp et al., 1992). So this raises the question of whether the treatment at specialized units leads to lower mortality or if the higher mortality in population-based studies is the measure of under diagnosing. A Swedish register-based study found a decreased mortality over time, when comparing two study populations consisting of patients suffering from AN in two different periods of time (Lindblad et al., 2006). This decrease could possibly be explained by the increased awareness, early intervention and the introduction of specialized care units for patients with EDs. However, these speculations were not examined closer in the study and a consensus as to the preferred treatment setting has yet to be determined.

A randomized controlled study from 2007 examined the outcome in three different treatment settings (inpatient psychiatric treatment, specialised outpatient treatment and general mental health treatment) (Gowers et al., 2007). The study found no difference in outcome in the three groups. A meta-analysis published in 2011 (Hartmann et al., 2011) found no good evidence for the preferred treatment setting and concluded that treatment guidelines for AN still have to rely on lower level evidence. The National Institute of Health and Care Excellence (NICE) guidelines for treating patients with EDs declare that decisions about the right treatment setting depends on the nature of the disorder and must be individually determined (NICE, 2004). The MARSIPAN group (MARSIPAN, 2010) released a report in 2010 regarding the management of severely ill AN patients. In this report, it was recommended that patients are treated in a collaborated setting with both somatic and psychiatric care. To our knowledge no evidence of decreased mortality in this type of setting has been reported.

Most studies published on outcome and mortality in EDs focus on AN, despite EDNOS being the most common ED in both clinical and community settings (Jenkins et al., 2011). Compared to studies on AN, evidence of increased SMR in BN and EDNOS respectively are weak. EDNOS was not an established diagnosis until the DSM-IV (American Psychiatric Association, 1994) was published in 1994, with which it became the largest diagnostic group. The declared purpose of the latest edition DSM-5 (American Psychiatric Association, 2013) was to reduce the prevalence of subjects with EDNOS. Diagnostic cross-over may further impact the results as approximately one-third of patients with an intake diagnosis of AN will cross over to BN (Eddy et al., 2008).

The aim of this study was to calculate the SMR for AN, BN and EDNOS in a large Danish cohort with a long follow-up time and compare mortality before and after the establishment of a formalized, specialized collaboration between psychiatric and somatic care.

2. Method

2.1. Participants

In 1994 a multidisciplinary centre for EDs was established at Odense University Hospital as the primary referral centre for patients with EDs on Funen. The island of Funen constitutes 9.7% of the Danish population and represents the Danish population demographically and socioeconomically (Gaist et al., 1997). Prior to the establishment of the centre, patients referred to the hospital with an ED were treated at either a psychiatric or a somatic department. There was no structured collaboration between the two departments and patients received treatment deemed necessary at the time. With the establishment of the centre all referrals were centralized and the centre works as an interdisciplinary cooperation between endocrinologists and psychiatrists. Health professionals from both departments conduct a preadmission assessment to establish a diagnosis, conduct a physical exam and determine the primary treatment course. Treatment offered in the centre consists of psychotherapy performed by psychologists or psychiatrists (cognitive, systemic or psychodynamic). Psychotherapy is either on individual level, in groups, as family therapy or as multi-family therapy. The individual psychotherapy sessions typically run over 1–3 years on a weekly basis. Individual psychotherapy is most commonly used in the adult patients. Children and adolescents usually partake in multifamilytherapy which proceeds over one year with a total of six–eight sessions. Multifamilytherapy includes six–seven families of AN patients. Regardless of the therapy form nutritional treatment is provided and runs parallel to the psychotherapy in an outpatient setting on a weekly basis. Patients are followed-up by an endocrinologist, dieticians and trained nurses. In severe cases stabilizing hospitalization is provided in a specialized nutritional section which works within the guidelines defined by, among others, The Royal College of Psychiatrists and the Royal College of Physicians, London (MARSIPAN, 2010). Staff from the centre meets regularly to discuss patient progress.

In this study all diagnostic categories were converted into the DSM-IV terminology for uniformity.

Prior to data analysis, we thoroughly reviewed all the individual files to check whether the patients met all the criteria according to DSM-IV. If all criteria for AN respectively BN were not definitely fulfilled, the diagnosis was changed to EDNOS. Mean body weight (BW) was expressed as percentage of ideal BW (IBW). IBW was defined as the median for height, age and gender according to reference values for 0–45 year-old Danes based on measurements made between 1965 and 1983 (Nysom et al., 2001). To ensure the diagnostic classifications were correct we used % IBW, as the cohort includes both children and adults.

The population in this study consists of all patients referred to *The Centre for Eating Disorders* by their general practitioner between January 1st 1994 and December 31st 2004. This cohort has been described previously (Stoving et al., 2012). By December 31st 2011 data from the *"Danish Register of Causes of Death"* was obtained to determine number and causes of death in the study population. In Denmark it has been mandatory by law, since 1871, to complete death certificates in the case of death. *"The Danish Register of Causes of Death"* has since then been fully computerised and, using a unique personal identification number, it includes all deaths among Danes dying in Denmark (Helweg-Larsen, 2011). Every year about 0.3–0.6% of all deaths are not fully reported where additional information about the patient's death must be retrieved from hospitals or general practitioners (Helweg-Larsen, 2011).

"The Danish Data Protection Agency" has reviewed and approved the research design.

This abovementioned cohort was compared to a register-based study performed in the same catchment area from 1977–1986 before the formation of the multidisciplinary centre. That study population was described by Joergensen (1992). Joergensen provided us with raw data of his study population, so we were able to include all data and were not confined to the published. This allowed us to include male and female patients in both cohorts.

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