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Short Report

Antidepressants and suicide among young women in Sweden 1999–2013

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Abstract.
OBJECTIVE: To establish whether the young women (15–24 year old) who committed suicide in Sweden (1999–2013) received antidepressant treatment or not, and to what extent, prior to and/or at the time of suicide. To investigate the belief that increased prescription of antidepressants would drastically reduce the number of suicides.
METHODS: An analysis of data from the Swedish Prescribed Drug Register, the Causes of Death Register, with registers cross checked, and from the National Board of Forensic Medicine.
RESULTS: This analysis shows a covariance between increased prescription of antidepressants and an increasing trend in the number of suicides among young women. In the period 1999–2003 antidepressants were found in toxicological analyses done in 23% of the young women who committed suicide, and in 39% of cases for 2009–2013.
CONCLUSION: An increasingly larger proportion of young women who later committed suicide, had in the last few years been treated with antidepressants, prior to and at the time of the suicide. The previous assumptions that treatment with antidepressants would lead to a drastic reduction in suicide rates, are incorrect for the population of young women. On the contrary, it was found that an increasing tendency of completed suicides follow the increased prescription of antidepressants.

Keywords: Antidepressants, suicide, young women, toxicology

1. Introduction

It has been assumed (Isacsson, Karolinska Institutet, 1994) [1] that half of those who commit suicide suffer from depression and that an increased prescription of antidepressants in the population, from 1% to 5%, would reduce the number of suicides by 25%. In the article Use of antidepressants among people committing suicide in Sweden, *BMJ,* (1994), Isacsson et al. concluded that about half of the patients who commit suicide are depressed, and that the most substantial finding in their study and those of others was that few people are taking antidepressants at the time of suicide [2].

In this short report I am to establish whether the young women (15–24 year old) who committed suicide in Sweden received antidepressant treatment or not, and to which extent, prior to and/or at the time of the suicide. The population of young women is chosen for investigation as the fifteen-year observation period (1999–2013) in this analysis coincides with an increased prescription of antidepressants in the whole population of young women, from 1.4% to 5% [3]. Thus the article also aims at

investigating the assumption (Isacsson) that such increased prescription of antidepressants drastically would reduce the number of suicides.

The data about antidepressant prescription rates and suicide for young women are also of interest in the discussion of the black box warnings issued by FDA 2004 and 2007 [4]. The FDA analysis leading to the warnings in 2004 showed a relative risk of suicidal behavior or ideation of 1.95 for young people treated with antidepressants compared with those given placebo. In May 2007 the warnings about increased risk for suicidality was extended to young adults 18 to 24.

2. Methods

The National Board of Forensic Medicine provided toxicological data relating to the young women (15–24) who committed suicide in Sweden 1999–2013, (N = 483). These data were obtained via the Freedom of Information Act. The data covered on average 93% of all confirmed suicides among young women for the years 1999–2013. Data about prescriptions of antidepressants have been obtained from the National Board of Health and Welfare.

In 2005 the Swedish Prescribed Drug Register [5] was changed. From that time it has been possible for the National Board of Health and Welfare to present more exact data about use of prescribed medications on an individual level. The register contains information about age, sex and unique identifier of the patient, as well as the prescriber's profession and practice [6]. The data in the register can be linked to the Causes of Death Register [7]. The National Board of Health and Welfare has therefore, specifically for this report, been able to compile and disclose information about the prescription of antidepressant drugs to young women, within 6 and 12 months before the suicide, in the period 2006–2013.

3. Results

In the period 1999–2013 there has been an increasing trend in the number of suicides among young women. The number of suicides among young women shows a declining trend from the 1980s to the 2000s. After that the trend in the number of suicides has been increasing [8] (Table 1).

Table 1
The number of suicides among young women in the years 1999–2013, and proportion per 100,000. Source: The Causes of Death Register of the National Board of Health and Welfare

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Number of deaths	32	26	18	23	35	32	36	51	35	40	43	31	36	34	48
Number of deaths per 100,000	6.35	5.19	3.58	4.49	6.68	6.04	6.64	9.15	6.10	6.80	7.16	5.10	5.93	5.64	8.07

The prescription of antidepressants and other psychotropic drugs for young women has risen sharply in the investigated fifteen-year period.

In 1999, the prescription of antidepressants for young women (15–24) was 14 daily doses per 1000 women in the age group (Defined daily doses per thousand inhabitants per day, DDD/TIND). This meant that 1.4% of all women in the age group potentially could be treated with antidepressants that year. In 2013, the equivalent prescription was 52 DDD/TIND—an increase of 270% (see Fig. 1) [9].

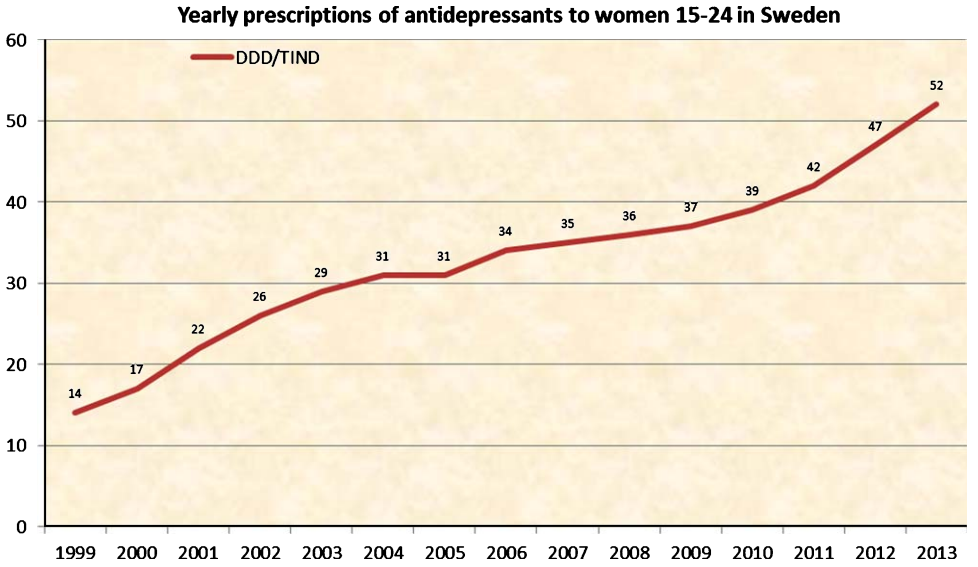

Fig. 1. Prescription of antidepressants to women (15–24) in Sweden in the years 1999–2013, counted in DDD/TIND.

In the year 2013, 36 141 young women (15–24) were treated with antidepressants according to the Register on Prescribed Pharmaceuticals in Sweden, 6% of all women in the age group. There is a covariance between the sharply increased prescription of antidepressants and the increase in the number of confirmed suicides among young women.

In the forensic toxicological screening carried out on women who committed suicide there has been a sharp rise in the findings of antidepressants and other psychotropic drugs.

Virtually all suicides in Sweden are subject to forensic toxicological analyses. Data from these studies for young women show that traces of antidepressants were found in 13% of cases for 1999 and in 41% of cases for 2013 (see Fig. 2) [10].

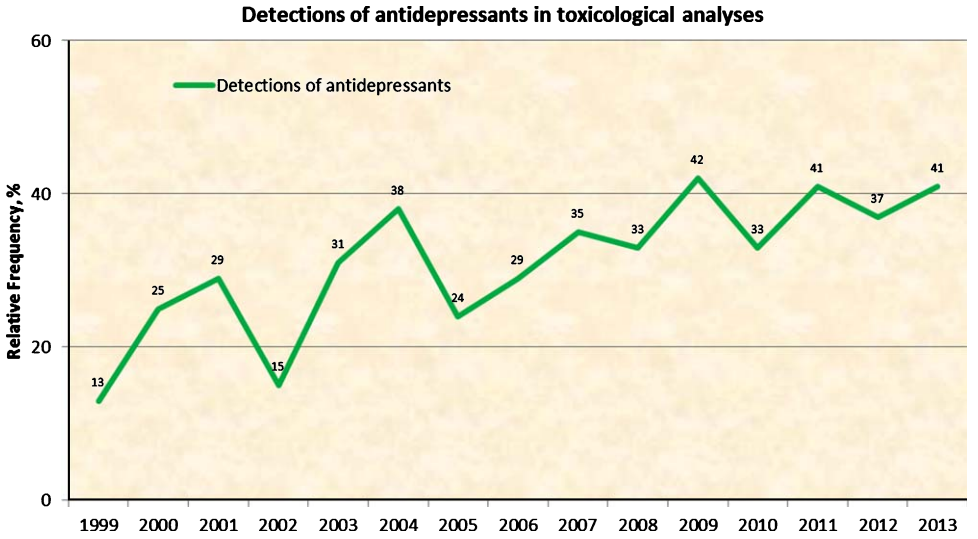

Fig. 2. Findings of antidepressants in toxicological analyses of suicides by women (15–24) in Sweden in the years 1999–2013, calculated as a percentage of the cases investigated, which were on average 93% of all confirmed suicides.

A comparison between time periods shows that traces of antidepressants were found in 23% of the cases for 1999–2003, and in 39% of cases for 2009–2013.

An increasingly larger proportion of young women who later committed suicide, has the last few years been treated with antidepressants. It can be shown that the young women who committed suicide to a large degree were treated with antidepressants, within 6 and 12 months before the suicide. On average, 51% of the women (2006–2013) were prescribed antidepressants within the 12-month period, and 41% within the 6-month period (see Fig. 3).

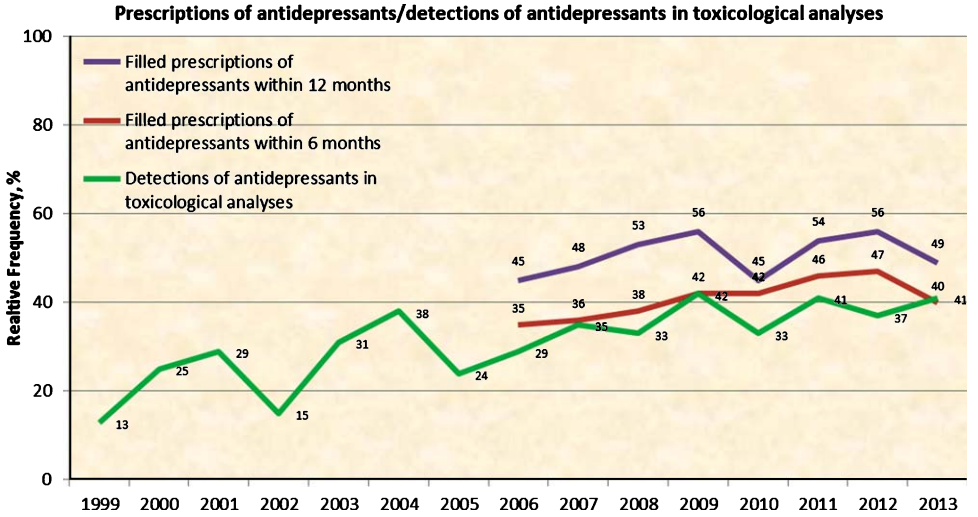

Fig. 3. Findings of antidepressants in toxicological analyses of suicides by women (15–24) in Sweden in the years 1999–2013, calculated as a percentage of the cases examined. Prescriptions of antidepressants within 12 and 6 months before the suicide for women (15–24) in the period 2006–2013 as a percentage. (The groups above are not *fully* comparable. In a few cases the women who had traces of antidepressants in the toxicological analysis can have got their drugs in another way than on prescription).

4. Discussion

This is an article about all confirmed suicides among young women (15–24) in Sweden 1999–2013. To my knowledge it is the first study where exposure to antidepressants are described for this age group of women by prescription *ante-mortem* (2006–2013) and by toxicology *post-mortem* (1999–2013). The study period commence in 1999, when just over 1% of all women (15–24) got antidepressants. The number of suicides was 32 (6.35/100 000). In 2013, 15 years later, prescription of antidepressants had increased by 270%, and *more* than 5% of all women in this age group were treated with antidepressants.

Instead of a *decline* in the number of suicides with 25%, when prescription rates increased from just over 1% to 5%, as hypothised by Isacsson 1994, we could see an *increasing trend* in the number of suicides. Of the women who committed suicide in the five-year period 2009–2013—where the estimation by Isacsson was that *half of them* suffered from depression—*more than half* (52%) were prescribed antidepressants within 12 months prior to the suicide. The findings in this analysis do not match with older data that most depressed patients who commit suicide are not taking antidepressant immediately prior to death.

It is surprising that old data about low levels of antidepressants found in toxicological analyses have been brought forward even in recent publications. In the article Can we really prevent suicide?,

published in *Current Psychiatry Reports* (2012), the authors describe that research has found that up to 80% of persons committing suicide is not treated for their psychiatric condition at the time of death [11]. A summary of toxicological analyses can be seen in the recent article Update on the Toxicology of Suicide, published in *Primary Psychiatry* (2013) [12]. The author of the update article (Dhossche) found it "striking that toxicologic studies of suicide have not featured in the discussion of the alleged increased urge for suicide by antidepressants". He referred to the Swedish researchers Goran Isacsson and Johan Ahlner, and their findings of antidepressants in 20% of the suicide cases, and in only 4% in the 15–19 age group [13]. He referred to a study of suicide among young persons (13–21) in Utah (1996–1999), with findings of psychotropic drugs in only 3% of investigated cases. The article also took up an investigation in New York (1999–2002), which found traces of antidepressants in only 2.8% of the cases. The same references are used by Gibbons in the article The statistics of suicide, published in *Shanghai Archives of Psychiatry* (2013) [14]. Despite being updates, studies from the 1990s were presented as reflecting the current situation.

5. Conclusion

This study shows that an increasingly larger proportion of young women, who later committed suicide, has the last few years been treated with antidepressants, prior to and at the time of the suicide.

Earlier data, that persons who commit suicide are "undertreated", has been found to be incorrect in this national analysis covering 15 years. Around 52% of the young women who committed suicide in 2013 had been prescribed antidepressants within 12 months prior to the suicide. In the period 1999–2003 antidepressants were found in toxicological analyses done in 23% of the young women who committed suicide, and in 39% of cases for 2009–2013. In 2013, the proportion was 41%.

The previous assumptions that treatment with antidepressants, and as deemed needed other psychotropic drugs, would lead to a drastic reduction in suicide rates, are incorrect for the population of young women. On the contrary, it was found that an increasing tendency of completed suicides follow the increased prescription of antidepressants.

Conflict of interest

None declared.

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