

A Twin Study of Suicide

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Suicide is a complex problem and a phenomenon of mankind which is obviously influenced by a multitude of ethnological, socio-cultural, psychological and various other factors.

That a man takes his own life does not necessarily mean that he was mentally abnormal. On the other hand, it is a well established fact that the frequency of mental illness — affective disorders in particular — is high among suicides, and that one in six patients suffering from manic-depressive psychosis will commit suicide (Sainsbury, 1968). A family history of suicide is not quite uncommon, and beforehand one cannot exclude the possibility that somehow genetic factors may play a part in suicide; but evidence in favour of such an assumption seems to be scanty.

A survey of the literature reveals that there have been very few twin studies of suicide, and so far concordance in MZ twins seems to have been reported in three cases only.

The first case was observed, already in 1812, by a Dr. Stephens Williams from Massachusetts. He described twin brothers, presumably MZ, who both were captains and had distinguished themselves in the War of Independence. One of the twins settled down in the beautiful state of Vermont, whereas the other remained in Springfield. For several years, they continued to live apart, until, within short interval, they both committed suicide by cutting their throat. Williams points out that the mother and two siblings of the twins had presented symptoms of mental illness, and that, prior to their death, both had been in a state of melancholy, probably an endogenous depression.

The second instance of concordance in MZ twins was published in 1863 by Baume. In this case, the twins, both male contractors at a railway, had lived closely together. They were robbed of a lot of money, and immediately afterwards both developed acute and very disturbed psychotic states, which ended by the suicide of both of them.

The third and last report of concordance in MZ twins was published in 1953 by Kallmann, who stated that this was the only concordant pair recorded in modern times. These male twins had similar histories of overt homosexual acts, and both developed what is described as acute schizophrenic psychoses while serving

in the armed forces in World War II. They committed suicide at 25 and 29 years of age, respectively.

There are scattered reports of discordance for suicide in MZ twins by Smith (1912), Soukhanoff (1912), Legras (1933), Vogt et al (1939), Loewenberg (1941) Rössle (1951), Gedda (1951), Koch (1957), Berger (1960), Swanson (1960) and Haberlandt (1965).

The only systematic twin study of suicide is the one published by Kallmann and Anastasio in 1946. During a 10 year period they collected 11 twin pairs (3 MZ and 8 DZ), all discordant as to suicide. In a later publication, Kallmann (1953) mentions that his series had been expanded to 18 MZ pairs, one of which — the case already described — was concordant.

The *present study* is based on a twin series derived from the psychiatric twin register, which is part of the twin register established by Harvald and Hauge and comprising all twins born in Denmark in 1870-1920. For a full description of this twin register, the methods used in collection of material, etc., we can refer to a recent publication by Hauge et al (1968).

A total number of 77 index cases (56 ♂♂ and 21 ♀♀ pairs) were ascertained from the register. The preponderance of males corresponds to the well known experience that more men than women commit suicide.

One problem when performing a twin study of suicide is the difficulty of establishing a basis for the determination of zygosity. In one case, a blood grouping, indicating a high probability of morozygosity, was available, as the pair had been investigated for other reasons prior to the suicide of the index case. In another MZ pair, an interview with the surviving twin was carried out, because these twins had been brought up apart in childhood, and were therefore included in the primary material of an investigation performed some years ago on MZ twins reared apart (Juel-Nielsen, 1965). For the remainder, determination of zygosity was based on information procured from the questionnaires used by the twin register, supplemented with other data concerning the degree of similarity between partners and difficulties of relatives or others in distinguishing between them. The reliability of this technique has been estimated to be high, with a frequency of misclassifications probably below 0.05.

According to these criteria, 19 pairs (14 ♂♂ and 5 ♀♀) were classified as MZ, and 58 pairs (42 ♂♂ and 16 ♀♀) as DZ twins. The fact that the distribution by sex is almost precisely the same — two thirds being ♂♂ pairs, as in the total material — may support that we are dealing with a representative sample.

One advantage of twin studies of suicide, compared with twin studies of psychiatric disorders in general, is that there is no difficulty in defining concordance and discordance. Of the 19 MZ pairs, 4 were concordant, while no case of concordance was found among the 58 DZ pairs.

In the first of the four concordant cases, both twins, males, had been admitted to psychiatric hospitals and received diagnoses of manic-depressive psychoses. With respect to method of suicide, they were discordant. One of them shot himself at the age of 60, whereas the other drowned himself four months later. Their father had hanged himself when 62.

In the second case, also a ♂♂ pair, the information available was a bit more scarce. The twins committed suicide at the age of 44 and 45 years, respectively. No less than five suicides were registered among close relatives.

The third case was a ♀♀ pair. Both twins had been repeatedly hospitalized because of psychiatric symptoms, and the case records suggest that both suffered from endogenous depressions. At the age of 42, both committed suicide by hanging themselves within an interval of one day only.

In the fourth and last case, one of these male twins was reported to have been melancholic before he hanged himself at the age of 39. His cotwin also presented similar periods, and, during a stay in a mental hospital, had been classified as manic-depressive. He hanged himself when 66.

A few words about the discordant MZ pairs. Of the 15 index cases, no less than 9 could be classified as psychiatric disorders. In 6 of these pairs, the cotwin had a psychiatric history which was so similar to that of the index case that a classification of concordance (3 cases as to manic-depressive psychosis, and 3 cases as to psychopathic personality) was justified.

The main result of our study is that no less than one fifth of the MZ twins was found to be concordant. Although psychological aspects of the twin relationship probably played a role in some of the cases, it seems safe to conclude that concordance for suicide in MZ twins may not be as rare as previously supposed, and also that the relatively high frequency of affective disorders in suicides indicates that, in some cases, genetic factors may indirectly condition the occurrence of suicide.

In this paper, it has not been possible to present the fairly comprehensive psychiatric case material collected in any greater detail, but it is our intention to publish a closer analysis, not only of the concordant, but especially of the discordant twin pairs, which, at least theoretically, should provide information about factors that may prevent a person from committing suicide.

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