

THE PREDICTION OF SUICIDE

Robert Goldney
Clinical Associate Professor
Flinders University
Senior Visiting Psychiatrist
Glenside Hospital

SUICIDE IS A DRAMATIC EVENT AND IT HAS A PROFOUND EFFECT UPON THOSE who have known the person who has committed suicide. It seems to be such a pointless waste of life and often, in retrospect, we can see measures which may have influenced the deceased. Inevitably we feel guilty about not having done just that little bit extra in trying to avert the suicide.

In this paper attention will be drawn both to the extent of suicide and suicidal ideation. The two will be drawn together and reference will be made to two studies which have tried to produce some understanding in our prediction of suicide.

Suicide and Suicidal Ideation

Each year in Australia more than two thousand people, the population of a small country town, commit suicide. A virtually incalculable number have suicidal ideation. Indeed, some would say that the existential contemplation of the meaning of life is in essence an acknowledgment of one's potential for suicide and almost invariably the clinician is met with the comment that it is normal to have suicidal thoughts.

There have been a number of studies which have examined the prevalence of suicidal ideation in different populations and the figures have varied from as little as 5 per cent suicidal ideation in a sample of the general population of two United States cities (Vandivort & Locke 1979), to as many as 50 per cent of subjects in a general psychology subject pool during examinations, also in the United States (Bonner & Rich 1987). With such a diversity of figures one could question their value. To place this in perspective there follows some data from the assessment of suicidal ideation in a young South Australian adult population.

In a sample of 1,014 young men and women, with a mean age of 19.6 years, we found that as many as 17.5 per cent of women and 20.2 per cent of men, or as few as 3 per cent of women and 3.3 per cent of men reported some degree of suicidal ideation in the few weeks prior to testing (Goldney et al. 1989).

These figures require some explanation. We assessed suicidal ideation on the basis of using the General Health Questionnaire, a commonly used instrument which delineates psychological disturbance. In this instrument there are four questions related to suicidal ideation. These are: 'have you felt that life is not worth living', 'have you found yourself wishing you were dead and away from it all', 'have you thought of the possibility that you

might do away with yourself'; and 'have you found the idea of taking your own life kept coming into your mind'.

If we simply used a positive response to any of those questions as indicating suicidal ideation, we arrived at the higher figures of 17.5 per cent of women and 20.2 per cent of men having suicidal ideation. We had some doubts about the reliability of those figures and decided to use what we termed a 'suicidal ideation score', which we derived from the General Health Questionnaire responses. Thus we used a Likert scaling of response to each question, with a cut-off score to provide a middle of the road figure of 11.7 per cent for men and 9.7 per cent for women as having significant suicidal ideation.

Now one can argue about the validity of this, but it seems that the most important factor to emerge is that whether we take the figure as 3 per cent or 10 per cent or 20 per cent, it represents a large number of people. For example, if we use the 10 per cent figure and extrapolate from our 19-year-old sample to the 15 to 24-year-old section of the Australian population, of whom there were 2.74 million in 1988, then this would mean that 274,000 Australians aged 15 to 24 years had suicidal ideation in 1988.

Now what does this mean? Can we take such figures seriously? How does this figure of 274,000 relate to the actual number of subjects who commit suicide each year, which of the ages 15 to 24 in 1988 was 448. Using these figures, it would suggest that one in 612 persons aged 15 to 24 years with suicidal ideation in 1988 went on to commit suicide.

To make this question just a little more difficult, it is of interest that we followed up those earlier subjects four years later and no less than 40 per cent of those who expressed suicidal ideation in 1984 denied ever having had any suicidal ideation in their lives when asked specifically in 1988 (Goldney et al. 1991).

There is a need to apologise for presenting such numbers and raising doubts about their pertinence at the outset of this paper. However, it is absolutely crucial to appreciate that there are many subjects with suicidal ideation, albeit fleeting; there are many subjects who subsequently deny ever having had suicidal ideation upon follow-up; and it is only a very small proportion of the overall suicidal subjects who actually commit suicide. In saying that it is only a 'small proportion', no attempt is being made to minimise the importance of those individual persons who commit suicide. However, if one is attempting to provide any hard data on the prediction of such events, one must maintain objectivity and resort to statistical methods to confirm or refute our clinical impressions.

Clinical Predictors of Suicide

There have been many clinical studies which have emphasised the importance of various factors in leading to suicide. These factors are traditionally considered to be the expression of suicidal ideation; the presence of psychiatric illness, particularly depression and schizophrenia; alcohol and other drug dependence; increasing age; chronic physical illness; social isolation; the availability of the means of self-destruction; and increasing publicity about suicide.

Statistical Prediction of Suicide

Although there have been many clinical studies, there have been very few statistical studies to actually test the power of the clinical predictors. Reference is made to two such studies. The first is an American study and the second was performed in Adelaide.

In an American study of 4,800 veterans admitted to psychiatric facilities in Houston, Pokorny (1983) identified 67 subsequent suicides, giving a suicide rate of 279 per 100,000 per year. A number of items were found to be significantly associated with suicide, including

the diagnoses of depression or schizophrenia; a history of suicide attempts or having been placed on suicide precautions; overt evidence of depression on the basis of the clinical examination; the complaint of insomnia and the presence of guilt feelings. In addition, there were forty-five other items, although their predictive value was not great.

Using a statistical method of calculating the power of individual predictors, and then using the twenty best predictors, it was possible to identify 35 of the 67 subjects who had suicided. This yielded a sensitivity of 55 per cent and a specificity of 74 per cent, figures which superficially appear encouraging. However, such a prediction of suicide was only made at the expense of 1,206 false positive identifications and led Pokorny to conclude that 'we do not possess any item of information or any combination of items that permit us to identify to a useful degree the particular persons who will commit suicide'.

The limitations which Pokorny referred to are further illustrated in examining our recent Australian data (Goldney et al. 1985; Goldney & Spence 1987). We identified 46 patients who had suicided after having had contact with a psychiatric hospital in Adelaide and compared these subjects with 46 controls who were selected on the basis of them being the next presenting patient of the same age and sex at the hospital after the patient who suicided had initially been assessed. We found a number of items which distinguished those who suicided. These items were the presence of a schizophrenic or depressive illness; a history of previous admissions; being unemployed; being drug dependent; having previously attempted suicide; having an involuntary admission; having alcohol or drug dependence in a first degree relative and being treated with major tranquilliser drugs and the injectable form of Fluphenazine (Modecate).

We examined the predictive ability of these ten items in two ways. We assigned an arbitrary score of 1 to each predictor and the sum of the scores for each patient was analysed for its sensitivity and specificity in predicting suicide. Using a cut-off point of 6 or more as indicating a higher risk, 24 of 37 suicides for whom complete data were available were correctly identified and there were five false predictions of suicide. This gave a sensitivity of 65 per cent and a specificity of 86 per cent. If we used a discriminate function analysis, that is a more sophisticated statistical weighting of the individual items, then a sensitivity of 83 per cent and a specificity of 67 per cent were obtained.

While these figures may appear acceptable, and in fact they are a little better than the Pokorny figures, it must be recalled that they are based on distinguishing those who suicided from an equal number of controls. This is the nub of the problem in the prediction of suicide. We can predict with some confidence if we know that, 37 of 74 subjects will inevitably commit suicide. But, the base rate of suicide is not 1 in 2. It is much less than this. As we have seen in our earlier example, it is 1 in 612 for subjects 15 to 24 years of age who have expressed suicidal ideation, and for the general population of 15 to 24-year-olds it is 1 in 6,120. This issue has been emphasised by Murphy (1983), a very respected researcher in the field of suicide prevention, who said that because of the low base rate of suicide one 'would need a test of unbelievable sensitivity and specificity to be of use'.

This point can be illustrated further by manipulating the base rates in the manner which is described by Pokorny in his American paper. If one uses a statistic that allows for a figure approaching 100 per cent to be a perfect prediction of an event, with 0 being a perfect prediction that the event will not occur and 50 per cent being a chance occurrence, then the Australian data with the suicide and control subjects combined, thereby giving a base rate of 1 in 2, allow the prediction of 79 per cent of the suicides. However, this predictive ability falls dramatically as the base rate decreases. Thus if the rate were 1 in 10, the prediction would fall to 62 per cent. For the rate of one in 100 patients committing suicide, the prediction using our predictors would fall to 50.7 per cent, a figure that could be arrived at by tossing a coin. When the true base rate for suicide of patients in our Australian study was used, namely 220 per 100,000 psychiatric admissions (a figure similar to the

Pokorny figure), the result is 49.7 per cent correctly predicted, again no different from that obtained by tossing a coin.

It is fair to note that these studies were not without their shortcomings. For example, age and sex, which are two factors said to be strongly associated with suicide, were not included in the analyses because of the case/control nature of the research designs. However, it is quite evident that our ability to devise instruments which predict suicide is very limited.

Conclusions

It is important to emphasise that clinicians are well aware of subtle nuances of patient presentation that may herald suicidal behaviour. The task remains to quantify such phenomena in order to provide more accurate prediction. However, at the same time we must acknowledge our shortcomings. Indeed, if so-called experts in the field cannot reliably predict suicide, we must not place unrealistic expectations on those people in the community, such as nurses and custodial officers, who may at times have the onerous duty of care of subjects who may be suicidal.

Those who engage in the challenging field of suicide prevention frequently feel frustrated, impotent and guilty because such self-inflicted behaviour cannot be prevented. The studies reviewed place the problem in a statistical perspective, but should not be perceived with pessimism. Rather, they should be used to promote confidence in traditional clinical values, instead of anticipating that some check list will soon emerge to make our decision making easier.

There are no simple answers. We must address our efforts to alleviate the despair and hopelessness which is the basis for most suicides. Furthermore, we must encourage all members of society to believe that suicide is not the normative way in which to proceed when one is emotionally distressed.

References

- Bonner, R.L. & Rich, A.R. 1987, 'Toward a predictive model of suicidal ideation and behaviour: some preliminary data in college students', *Suicide and Life Threatening Behaviour*, vol. 17, pp. 50-63.
- Goldney, R.D. & Spence, N.D. 1987, 'Is suicide predictable?' *Australian and New Zealand Journal of Psychiatry*, vol. 21, pp. 3-4.
- Goldney, R.D., Positano, S., Spence, N.D. & Rosenman, S. J. 1985, 'Suicide in association with psychiatric hospitalisation', *Australian and New Zealand Journal of Psychiatry*, vol. 19, pp. 177-83.
- Goldney, R.D., Smith, S., Winefield, A.H., Tiggemann, M. & Winefield, H.R. 1991, 'Suicidal Ideation: its enduring nature and associated morbidity', *Acta Psychiatrica, Scandinavica*, vol. 83, pp. 115-20.
- Goldney, R.D., Winefield, A.H., Tiggemann, M., Winefield, H.R. & Smith, S. 1989, 'Suicidal ideation in a young adult population', *Acta Psychiatrica Scandinavica*, vol. 79, pp. 481-9.

The Prediction of Suicide

Murphy, G.E. 1983, 'On suicide prediction and prevention', *Archives of General Psychiatry*, vol. 40, pp. 343-4.

Pokorny, A.D. 1983, 'Prediction of suicide in psychiatric patients', *Archives of General Psychiatry*, vol. 40, pp. 249-57.

Vandivort, D.S. & Locke, B.Z. 1979, 'Suicide ideation: its relation to depression, suicide and suicide attempt', *Suicide and Life Threatening Behaviour*, vol. 9, pp. 205-18.