European Child & Adolescent Psychiatry
10:161–169 (2001) © Steinkopff Verlag 2001

ORIGINAL CONTRIBUTION

A. Hultén
G.-X. Jiang
D. Wasserman
K. Hawton
H. Hjelmeland
D. De Leo
A. Ostamo
E. Salander-Renberg
A. Schmidtke

Repetition of attempted suicide among teenagers in Europe: frequency, timing and risk factors

Accepted: 19 February 2001

A. Hultén (✉) · G.-X. Jiang · D. Wasserman
Swedish National Centre for Suicide Research and Prevention of Mental Ill-Health at the National Institute for Psychosocial Medicine/Department of Public Health Sciences
Karolinska Institute
Box 230
17177 Stockholm, Sweden
Tel.: +46-87 28 70 26
e-mail: suicid.forskning@ipm.ki.se
agneshulten@yahoo.com

K. Hawton
Centre for Suicide Research
University Department of Psychiatry
Warneford Hospital
Oxford OX3 7JX, UK

H. Hjelmeland
Department of Psychology
Norwegian University of Science and Technology
7491 Trondheim, Norway

D. De Leo
Servizio Di Psicogeriatria
Università Degli Studi Di Padova
Padova, Italy

A. Ostamo
National Public Health Institute
Department of Mental Health and Alcohol Research
Helsinki, Finland

E. Salander-Renberg
Psychiatry, Department of Clinical Science
Umeå University
90185 Umeå, Sweden

A. Schmidtke
Universitäts Nervenklinik
Füchsleinstrasse 15
97080 Würzburg, Germany

Abstract *Background.* Adolescents in many countries show high rates of suicide attempts and repetitions of attempts as a common feature. Attempted suicide is the best predictor of future suicide. Repetition of attempts further increases the risk of suicide. The present study sought to identify patterns and risk factors for repetition of attempts in older teenagers. *Methods.* Data were collected by uniform procedures in a longitudinal follow-up study in seven European centres participating in the WHO/EURO Multicentre Study on Suicidal Behaviour. Information on attempted suicide in the 15–19-year age group during the period 1989–1995 was analysed. *Results.* A total of 1,720 attempts by 1,264 individuals over a mean follow-up period of 204 weeks (SD 108.9) were recorded. When life-table analysis was performed, 24 % of the individuals who had previously attempted suicide made another attempt within one year after the index attempt, compared with 6.8 % of the "first-evers", with no major gender difference. Cox regression analysis revealed that previous attempted suicide (OR 3.3, 95 % CI 2.4–4.4) and use of "hard" methods (OR 1.5, 95 % CI 1.1–2.1) were both significantly associated with repetition of attempted suicide. Stepwise Cox regression analysis showed that a history of previous attempted suicide was the most important independent predictor of repetition (OR 3.2, 95 % CI 2.4–4.4). *Conclusion.* For young suicide attempters, follow-up and adequate aftercare are very important if repetition and risk of suicide are to be reduced. This applies particularly to those who have already made more than one attempt.

Key words Young people – Attempted suicide – Repetition

Introduction

Adolescent suicide and attempted suicide have been recognised as a growing health problem in both Europe and the rest of the world. The number of articles reporting potential factors associated with suicidal behaviour in young people is vast. For review, see studies from Finland, USA and New Zealand (1, 2, 5, 6, 17, 22). Young people of both sexes often make repeated suicide attempts (4, 16, 19, 24).

In a study on Swedish material it was shown as early

ECAP 231

as in 1972 that the risk of repetition was highest during the first year after a suicide attempt for young males (23). Others have confirmed his findings that young males tended to use more lethal methods in attempts and to repeat more often than females (1, 7, 21). A previous suicide attempt is in itself the strongest predictor of future suicide and local rates of attempted suicide and regional and national suicide rates in young people, especially males, are strongly correlated (13). There is an association between repeated suicide attempts and completed suicide, particularly in males and when a violent method has been used (11, 12, 18, 23, 25).

The European Task Force for Suicide Prevention initiated the WHO/EURO Multicentre Study of Suicidal Behaviour (3) in order to obtain reliable epidemiological data of attempted suicide in countries in Europe. Since 1989, 16 research centres in 13 European countries have registered in defined study populations all attempted suicide patients aged 15 years and over who have received medical health care as a result of their overdose or self injury (26).

The purpose of the present study was to describe the pattern of repetition of attempted suicide and identify relevant factors associated with repeated suicidal behaviour among young people aged 15–19 years in some European countries. The hypotheses were that the risk of repetition would be highest within the first year after attempted suicide in adolescents, that a history of attempted suicide would be associated with a higher repetition rate in both sexes, and that recommended aftercare and different methods used in the suicide attempt may have an association with later repetition.

Methods

Centres

Some of the participating centres in the WHO/EURO Multicentre Study of Suicidal Behaviour were excluded from this analysis on account of a high proportion of missing data. Hence, data from the following seven European centres were included during the period 1989–1995: Padova (Italy), Helsinki (Finland), Oxford (United Kingdom), Stockholm and Umeå (Sweden), Sør-Trøndelag (Norway) and Würzburg (Germany). All centres registered patients who had attempted suicide and received somatic hospital emergency treatment during the period of study. Other centres were not included in the study because of incomplete data from the follow-up period.

Data set

The participating centres used similar registration procedures for individuals treated after attempted suicide. The follow-up period was calculated from the date of each initial index attempt to the end of 1995 and was counted in days and weeks.

Based on unique individual codes, a data set was constructed including only the records of the individual persons, with a record of the index attempt and of any repetitions leading to health care contact during the follow-up period. This data set includes information on a wide range of demographic and clinical variables. In this study the following variables have been analysed: age, gender, centre, presence of previous attempted suicide, aftercare recommended and type of methods used in the index attempt that brought each individual into the study.

The item "recommended next stage of health care" describes the care recommended after somatic emergency treatment in relation to the index suicide attempt that was completed. It might, for example, involve psychiatric out-patient or in-patient care by a member of a mental healthcare team.

The WHO International Classification of Diseases, tenth revision (ICD-10) (15), was used to classify the methods used in the attempts into 25 different categories. Methods X60-X69 are those that may be designated as "soft", including self-poisoning with medicaments, drugs or other substances. Methods X70-X84 include self-harm of a violent ("hard") nature, i. e. attempted suicide by hanging, jumping or cutting with sharp objects, etc.

Missing values

Information on certain variables was not available in some cases. For example, data on the variable "previous suicide attempt/s" were missing for 270 individuals (21.4 %). Information for the variable "recommended next stage of health care" was missing in 168 cases (13.3 %) and information for the variable "method used" was incomplete in 51 individuals (4 %). The cases with missing values were excluded from specific analyses when the relevant information was not available.

Statistic analysis

Comparisons between non-repeaters and repeaters during the follow-up period after the index attempted suicide have been performed concerning the above-mentioned variables in the data set, in order to identify predictors for the repetition of attempted suicide.

Because the follow-up period was not the same for

each individual, survival analyses were used, so that the information from censored cases could be dealt with appropriately.

Cox regression analysis was performed to identify the predictors for repetition of attempted suicide. The probability of a repeated attempt expressed as an odds ratio (OR) with 95 % confidence intervals (CI) was calculated for the following variables respectively: a) age as a continuous variable, b) gender, c) centre as a category variable, and the repetition rate for each centre as a continuous variable, d) previous suicide attempt/s before the index attempt, e) recommended care after the index attempt and f) method used in the index attempt ("soft", "hard"). A forward stepwise Cox regression analysis was performed with the variables age, gender, previous suicide attempt, recommended next care and methods used at the index attempt as covariates. In order to investigate the interaction between centre and previous attempted suicide, a multivariate Cox regression analysis was also performed including the variables previous attempted suicide, repetition rate of each centre and an interactive variable resulting from multiplying these two variables.

Life-table analysis was conducted to calculate the "survival rate", which indicates the possibility of repetition-free survival for two years, after the index attempt measured at 30-day intervals. This was done for the two genders separately and for the other variables listed above. The start-point is the index suicide attempt and the end-point is the first repetition, or the end of the follow-up period for those without repetition of attempted suicide. Although the patients entered the observation period at different times and had been observed for different lengths of time at the end of the study period, the life-table results were obtained by calculating repetitions of attempted suicide during each of the distinct observation intervals of the study (30 days, 60 days,… up to 780 days after the index attempt).

Results

During the study period (1989–1995) there were 1,720 attempts, 1,224 by girls and 496 by boys, involving 1,264 individuals (915 girls and 349 boys) aged 15–19 years. The annual numbers of individuals are shown by centre and gender in Table 1. In general, the female- to male-gender ratio was similar during the seven years, ranging between 2.0 and 3.1. The mean follow-up period was 204 weeks (SD 108.9) (approximately 3.9 years), 208 weeks (SD 107.7) for males and 203 weeks (SD 109.4) for females. The longest follow-up period was seven years. Of 1,264 individuals, 217 (66 males and 151 females), or 17.2 % of the whole group made repeat attempts during the follow-up period. Repetitions were multiple in many cases, with the largest number of repeat episodes by one single individual being 21.

Table 1 Annual numbers of persons aged 15–19 years by gender and centre

Centre	1989			1990			1991			1992			1993			1994			1995			Total			
	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female	All	(%)
Padova	1	15	16	3	11	14	0	12	12	1	8	9	2	9	11	2	5	7	3	10	13	12	70	82	6.49
Helsinki	22	47	69	15	16	31	5	6	11	7	6	13	3	3	6	3	8	11	1	8	9	56	94	150	11.87
Würzburg	3	16	19	3	8	11	7	20	27	3	13	16	8	12	20	3	17	20	4	9	13	31	95	126	9.97
Umeå	5	16	21	9	19	28	4	14	18	4	16	20	2	14	16	1	10	11	2	15	17	27	104	131	10.36
Stockholm	9	27	36	6	23	29	4	20	24	7	16	23	4	31	35	3	19	22	3	11	14	36	147	183	14.48
Sør-Trøndelag	10	22	32	11	23	34	8	20	28	13	22	35	11	16	27	7	11	18	4	10	14	64	124	188	14.87
Oxford	19	55	74	22	37	59	19	42	61	12	31	43	7	31	38	21	33	54	23	52	75	123	281	404	31.96
Total	69	198	267	69	137	206	47	134	181	47	112	159	37	116	153	40	103	143	40	115	155	349	915	1264	100.0

Table 2 Number of persons aged 15–19 years recommended aftercare at the index suicide attempt

	Recommended aftercare			
	None (%)	Out-patient (%)	In-patient (%)	Total (100 %)
Male				
Non-repeaters	57 (25.4)	114 (50.9)	53 (23.7)	224
Repeaters	16 (26.7)	31 (51.7)	13 (21.7)	60
All	73 (25.7)	145 (51.1)	66 (23.2)	284
Female				
Non-repeaters	155 (23.1)	318 (47.3)	199 (29.6)	672
Repeaters	25 (17.9)	65 (46.4)	50 (35.7)	140
All	180 (22.2)	383 (47.2)	249 (30.7)	812
Both genders				
Non-repeaters	212 (23.7)	432 (48.2)	252 (28.1)	896
Repeaters	41 (20.5)	96 (48.0)	63 (31.5)	200
All	253 (23.1)	528 (48.2)	315 (28.7)	1,096

Recommended aftercare

As can be seen in Table 2, there was little difference in the frequency with which aftercare was offered after the index attempt between those who did (159/200, 79.5 %) and those who did not repeat during the follow-up period (684/896, 76.3 %, OR 1.23, 95 % CI 0.87–1.73). Girls who were recommended psychiatric in-patient care after the index attempt repeated slightly more than those without recommended aftercare.

Methods used and gender

Repetition was more frequent among individuals who had used a "hard" method (X70-X84), compared with those who used a "soft" method (X60-X69), at the index suicide attempt (OR 1.51, 95 % CI 1.11–2.05). No significant gender differences were found (Table 3).

Table 3 Methods used in index attempts, classified as "soft" or "hard", by centre

	Methods used for index attempted suicide		
	Soft. X60-X69 (%)	Hard. X70-X84 (%)	Total (100 %)
Male			
Non-repeaters	199 (75.4)	65 (24.6)	264
Repeaters	42 (66.7)	21 (33.3)	63
All	241 (73.7)	86 (26.3)	327
Female			
Non-repeaters	615 (83.3)	123 (16.7)	738
Repeaters	111 (75.0)	37 (25.0)	148
All	726 (81.9)	160 (18.1)	886
Both genders			
Non-repeaters	814 (81.2)	188 (18.8)	1,002
Repeaters	153 (72.5)	58 (27.5)	211
All	967 (79.7)	246 (20.3)	1,213

Previous attempted suicide

37.9 % of the individuals had previously attempted suicide before the index episode (Table 4). A significantly higher proportion of individuals (30 %) with a history of previous attempts repeated during the follow-up period compared to those without such a history, 10.5 % (OR 3.27, 95 % CI 2.40–4.44).

In the stepwise Cox regression analysis the variables age, gender, previous suicide attempt, recommended next care and methods were used as covariates. Only the variable of previous attempted suicide was left in the final model as an independent predictor of repetition of attempted suicide (OR 3.21, 95 % CI 2.35–4.40). There were weak associations with type of method used (p = 0.062) and age (p = 0.081), but these were excluded from

Table 4 History of previous attempt/s

	Previous attempted suicide				
	Never (%) n=617	Yes, within last 12 months (%) n=207	Yes, more than 12 months ago (%) n=138	Yes, date unsure/unknown (%) n=32	Total (100 %) n=994
Gender					
Male	160 (66.7)	44 (18.3)	28 (11.7)	8 (3.3)	240
Female	457 (60.6)	163 (21.6)	110 (14.6)	24 (3.2)	754
Repetition					
Non-repeaters	552 (67.6)	138 (16.9)	103 (12.6)	23 (2.8)	816
Repeaters	65 (36.5)	69 (38.8)	35 (19.7)	9 (5.1)	178

the final model. Genders ($p = 0.129$) and whether or not care was recommended ($p = 0.740$) bore no association with repetition.

Interactions

The number of cases, proportions with previous attempts, repetition rate during the study period and results from Cox regression analysis on the association between previous attempted suicide and repetition by each centre are presented in Table 5. The results indicate that the OR for the association of previous attempted suicide with subsequent repetition varied between centres but was always higher than 1.0 for each of the seven centres.

However, for two of the centres the ratio was not significant. When the Cox regression analysis was performed on the pooled data from the seven centres, the OR was 3.27 (95% CI 2.40–4.44), and 3.19 (95% CI 2.34–4.35) when the analysis was performed on the data with strata function of the centre.

The interaction between the variables "previous attempted suicide" and "centre" was investigated by performing a multivariate Cox regression model, including the variables "previous attempted suicide" and "repetition rate of each centre" as well as an interactive variable resulting from multiplying these two variables, in order to investigate the role of the centres. The results showed that the *p*-value of the interactive variable in the model was 0.611, and indicated that the interaction between the above-mentioned variables was not important.

Repetition-free survival

The survival rates (i. e. repetition-free) for males and females during a two-year period after the index attempt for males and females are shown in Fig. 1 (including both adolescents with previous attempt/s and those making their first ever attempt). More than 10% of the individuals in the study made repeat attempts within the first year. The survival curve is slightly lower for males during the two-year period after the index attempt, but the difference between genders is negligible. The survival rate decreased very rapidly for individuals with previous attempts, particularly in the first year after the index attempt. Overall, 24.3% of those who were repeaters at the index presentation repeated during the follow-up period, compared to 6.8% of "first-evers" (Fig. 2). The survival curve for those individuals whose previous history of suicide attempts was unknown lay between the curve for those with previous episodes and

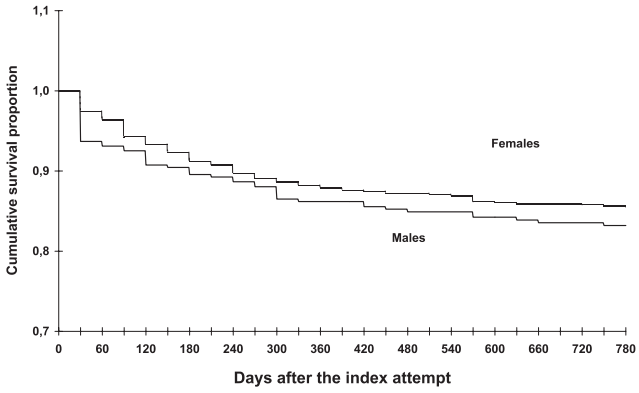

Fig. 1 Repetition-free survival of attempted suicide for individuals aged 15–19 years by gender

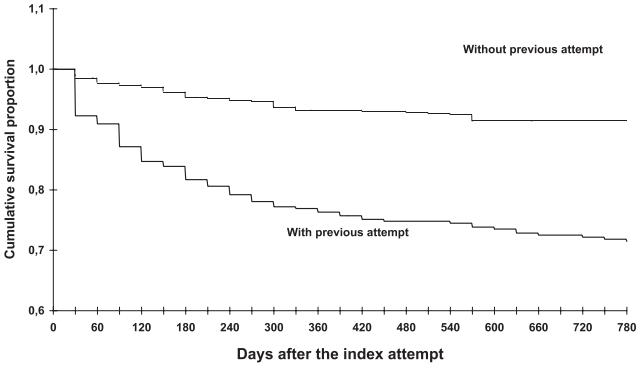

Fig. 2 Repetition-free survival of attempted suicide for individuals aged 15–19 years by previous attempt

Table 5 Number of cases, proportions in previous attempts, repetition rate during follow-up period; results of Cox regression analysis in which repetition of attempted suicide was the status variable and previous attempts the covariate by centre

Centre	Number of cases	Previous attempted suicide (%)	Repetition rate during the study period (%)	Cox regression analysis		
				Odds ratio	95 % CI	*p*-value
Padova	82	21.7	8.5	22.12	2.56–190.83	0.005
Helsinki	150	35	11.3	7.88	2.20–28.30	0.002
Würzburg	126	38.7	11.9	3.33	1.00–11.05	0.050
Umeå	131	46.2	22.1	3.13	1.41–6.94	0.005
Stockholm	183	32.7	12.6	2.21	0.92–5.31	0.077
Sør-Trøndelag	188	41.9	14.9	1.50	0.64–3.54	0.870
Oxford	404	39.4	24.3	3.28	2.05–5.26	0.000

those without a previous attempt (data not shown). When the analysis was conducted for those with a previous attempt during the 12 months before the index episode and those for whom it was more than 12 months beforehand, the repetition-free survival rates were much lower for those with a previous attempt during the last 12 months (Fig. 3).

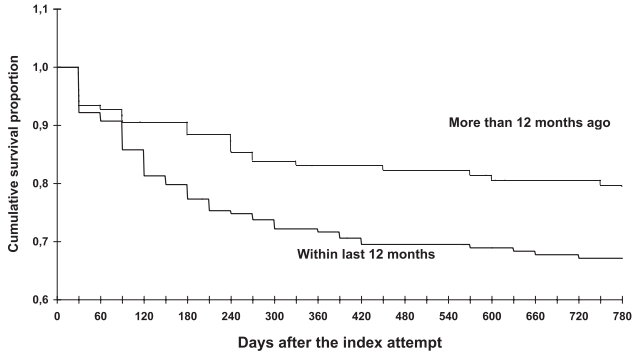

Fig. 3 Repetition-free survival of attempted suicide for individuals aged 15–19 years with previous attempt (within last 12 months or more than 12 months ago)

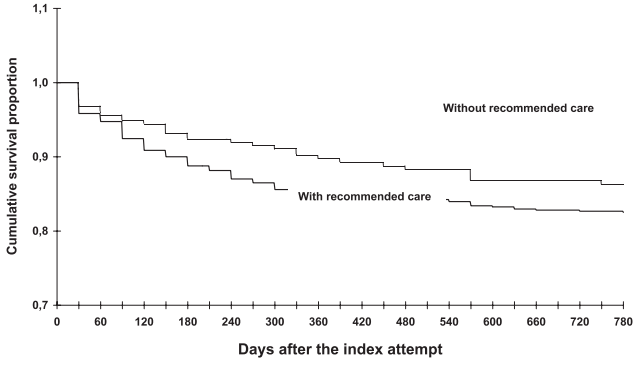

Fig. 4 Repetition-free survival of attempted suicide for individuals aged 15–19 years by recommended care

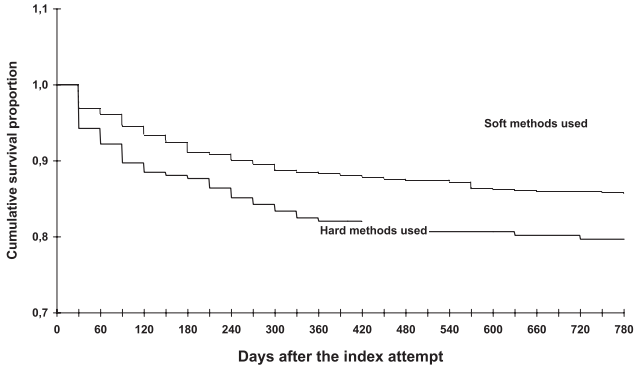

Fig. 5 Repetition-free survival of attempted suicide for individuals aged 15–19 years by methods used

The survival curves for patients with or without recommended care and for patients who used "soft" or "hard" methods are shown in Figs. 4 and 5. Results showed that recommended aftercare and the use of "hard" methods are associated with lower repetition-free survival rates.

Discussion

Methodological issues

Until now it has been difficult to obtain comparable international data on suicide attempts, owing to disparities in definitions, survey designs and study methods. The WHO/EURO Multicentre Study of Suicidal Behaviour has a precise design and methodology for the investigation of patients who attempt suicide. Participating centres use the same definition of attempted suicide, uniform registration protocols and very similar registration procedures. The validity and reliability of the study were checked on a regular basis in each centre as they have been in other studies (3, 26). The present study is a prospective monitoring of repetition of attempts among young people after an index suicide attempt. The large number of patients in this study means that the findings are reliable, and the prospective follow-up design avoids some of the biases and produces greater reliability than a retrospective design. As many as 1,264 individuals and 1,720 attempted suicide events were included. The longest follow-up period was seven years. The total number of person-years for the duration of follow-up was nearly 5,000.

The amount of missing information varied between the variables. One possible explanation for the differences in missing data may be prompt self-discharge from the Emergency Department in some cases, where interviews were brief, with incomplete answers owing to lack of time. Information regarding age, gender and method of suicide attempt is readily obtainable from case records, but this does not always apply to a history of previous episodes and the aftercare recommended. Survival analyses including Cox regression analysis and life-table analysis were performed so that the data of time-to-event could be treated properly and repetition-free survival rates could be calculated for certain time periods after the index attempt.

There might be some limitations and biases due to the excluding cases with missing values and of the combining of data from different centres. Therefore, we evaluated the survival curve for the excluded group and found it lay between the curves of the other two analysed groups "with" and "without" previous suicide attempt, which may indicate that the excluded group is not specifically biased to any one of the two analysed groups. In addition, the interaction between the vari-

ables "previous attempted suicide" and "centre" was also analysed and the results indicated that the interaction between these variables was not important.

Repetition of attempted suicide

The proportion of all patients who repeated attempts was 17.2 % during the follow-up period. From other studies the risk of repetition of attempts in adolescents ranges from 10 % within six months to 42 % during a 21-month follow-up period, with a median recurrence of 5–15 % each year (5).

More than 10 % of all patients in the present study (both repeaters and "first-timers") made repeat attempts within one year. Goldacre (8), Brent (4), Pfeffer (24) and Spirito (27) reported that repetition occurs most frequently during the first few months after attempted suicide. In a recent follow-up study of French adolescents who had attempted suicide, the frequency of repetition was lower, but in line with our study (20). Of those who repeated, 34 % of both sexes did so within six months. In a prospective naturalistic follow-up study by Goldston (9), 12 % of adolescents admitted to hospital for suicide attempts made repeat attempts within the first year after discharge and the number of prior attempts was the strongest predictor of post-hospitalisation attempt/s.

Differences between subgroups

Previous suicide attempt/s had been made by 37.9 % of the overall sample at the beginning of the study, a figure that is high but comparable to previous studies in the WHO/EURO population from the age of 15.

A significantly higher proportion (30 %) of individuals with a history of previous attempt made another attempt during the entire follow-up period compared to those making their first-ever attempt (10.5 %). As many as 24.3 % of individuals with previous attempts repeated within the first year, compared with only 6.8 % of "first-evers". Goldston (10) found that 27 % of adolescents with previous suicide attempts repeated after the index attempt, compared to 10 % of those without such a history.

The increased risk of repetition expressed as odds ratio, was significantly higher for individuals with a history of previous attempt compared to those without such a history (OR 3.3). No gender differences were found between the two groups, indicating that those who repeat their attempts are wrestling with roughly the same type of problem regardless of gender.

The results from the analysis of interaction between previous attempts and centre indicated no important interaction. Therefore, it was appropriate to pool the data from the seven centres in this analysis. It also supported the findings that the variable of "previous attempted suicide" was the most important predictor for the repetition of attempted suicide in those variables that could be examined. The further analysis of those with a history of a previous attempt within the 12 months preceding the index episode and those with a previous episode more than 12 months beforehand indicated that the recency of a previous attempt is an important factor associated with risk of repetition.

Aftercare recommended at the index suicide attempt

In-patient treatment had been recommended more often to female than male repeaters (35.7 % vs 21.7 %), perhaps indicating more severe psychiatric and psychosocial difficulties and/or higher compliance with treatment in females. One explanation to the higher proportion of female in-patient treatment could be that suggested by Suokas (28) in a Finnish study. Alcohol consumption shortly before or at the time of suicide attempts was more common among young men with previous suicide attempts and their suicide risk was assessed as less severe. They were, therefore, more often left without aftercare than others who had not consumed alcohol. In contrast, Gasquet (7) showed that more French males than females had been referred to psychiatric in-patient care (17.3 % vs 7.4 %).

A recent study carried out in nine European countries participating in the WHO/EURO Multicentre Study of Suicidal Behaviour indicated that far from all adolescents who had attempted suicide were recommended aftercare (14), despite the fact that past suicidal behaviour predicts future suicidal behaviour. Young people with previous suicide attempts had an overall significantly higher chance of being recommended aftercare compared to first-ever suicide attempters, yet 29 % of these boys and 26 % of the girls were not recommended any aftercare at all. It was clear that no uniform care policy exists in Europe for young people presenting to healthcare facilities following suicide attempts.

Methods used at the index suicide attempt

Although repetition was more frequent among individuals who had used a "hard" method at the suicide attempt compared to "soft" (OR 1.5), the method chosen was not statistically significant as a predictive factor in the final Cox regression model. Clinical research has shown that the method used when attempting suicide can influence the future process of suicidal behaviour (21). Otto (23) reported that adolescents who had used violent methods (including self-cutting) when attempting suicide repeated their suicide attempts using more

aggressive methods and were at higher risk for later suicide.

The classification of methods used for suicide attempts among adolescents can be different, particularly when clinical and research purposes are kept in mind. Many adolescent girls cut themselves which often is less harmful from a medical point of view. On the other hand, "cutting" by female adolescents is mentioned as pathologic self-mutilation in conjunction with borderline personality disorders. Self-mutilation behaviour is also associated with serious psychiatric diagnoses, e. g. alcohol abuse, bulimia, antisocial behaviour and impulsiveness, and, so far, health-care services show few effective methods of treatment for this group of patients.

Conclusion

Recurrent suicidal behaviour is a risk factor for completed suicide and it places a great burden on the patients, on their relationships and on the healthcare system. The findings from the present study indicate that more than 10 % of the adolescents would repeat a suicide attempt within one year.

At the present time there are no known effective treatments for suicidal behaviour in the teens as such, but a more active outreach is demanded to obtain treatment compliance in this age group, i. e. vigorous tracking for those individuals who drop out and development of care services specialised for suicidal adolescents.

Acknowledgements Data used in this study were obtained in the WHO/EURO Multicentre Study of Suicidal Behaviour. Financial support was provided by the Swedish Council for Planning and Co-ordination of Research (ref. 920430) and the Stockholm County Council Public Health Committee.

References

1. Beautrais AL (1996) Serious suicide attempts in young people: a case control study. American Journal of Psychiatry 153:1009–1014
2. Beautrais A (2000) Risk factors for suicide and attempted suicide among young people. Australian and New Zealand Journal of Psychiatry 34: 420–436
3. Bille-Brahe U, Bjerke T, Crepet P, DeLeo D, Haring C, Hawton K, Kerkhof A, Lönnqvist J, Michel K, Philippe A, Pommereau X, Querejeta I, Salander-Renberg E, Schmidtke A, Temesváry B, Wasserman, D Sampaio-Faria J G (1993) WHO/EURO Multicentre Study on Parasuicide. Facts and figures. Copenhagen World Health Organization
4. Brent DA, Kolko DJ, Wartella ME, Boylan M, Moritz G, Baugher M, Zlenak J (1993) Adolescent psychiatric inpatients' risk of suicide attempt at 6-month follow-up. Journal of the American Academy of Child and Adolescent Psychiatry 32:95–105
5. Brent DA (1997) Practitioner review: the aftercare of adolescents with deliberate self-harm. Journal of Child Psychology and Psychiatry 38:277–286
6. Davidson L, Linnoila M (1991) Risk factors for youth suicide. Report of the Secretary's Task Force on Youth Suicide
7. Gasquet I, Choquet M (1993) Gender role in adolescent suicidal behaviour: observations and therapeutic implications. Acta Psychiatrica Scandinavica 87:59–65
8. Goldacre M, Hawton K (1985) Repetition of self-poisoning and subsequent death in adolescents who take overdoses. British Journal of Psychiatry 146:395–408
9. Goldston DB, Daniel S, Reboussin DM, Kelley A, Ievers C, Brunstetter R (1996) First-time suicide attempters, repeat attempters and previous attempters on an adolescent inpatient psychiatry unit. Journal of the American Academy of Child and Adolescent Psychiatry 35:631–639
10. Goldston DB, Daniel, S, Reboussin DM, Reboussin BA, Frazier PH, Kelley AE (1999) Suicide attempts among formerly hospitalised adolescents: a prospective naturalistic study of risk during the first 5 years after discharge. Journal of the American Academy of Child and Adolescent Psychiatry 38:660–971
11. Granboulan V, Rabain D, Basquin M (1995) The outcome of adolescent suicide attempts. Acta Psychiatrica Scandinavica 91:265–270
12. Hawton K, Fagg J, Platt S, Hawkins M (1993) Factors associated with suicide after parasuicide in young people. British Journal of Psychiatry 306: 1641–1644
13. Hawton K, Arensman E, Wasserman D, Hultén A, Bille-Brahe U, Bjerke T, Crepet P, Deisenhammer E, Kerkhof A, De Leo D, Michel K, Ostamo A, Philippe A, Querejeta I, Salander-Renberg E, Schmidtke A, Temesváry B (1998) Relation between attempted suicide and suicide rates among young people in Europe. Journal of Epidemiology and Community Health 52:191–194
14. Hultén A, Wasserman D, Hawton K, Jiang G-X, Salander-Renberg E, Schmidtke A, Bille-Brahe U, Bjerke T, Kerkhof A, Michel K, Querejeta I (2000) Recommended care for young people (15–19 years) after suicide attempts in certain European countries. European Child and Adolescent Psychiatry 9:100–108
15. International Classification of Diseases and Related Health Problems, Tenth Revision 1995 (ICD10)
16. Ivarsson T (1998) Depression and Depressive Symptoms in Adolescence: Clinical and Epidemiological Studies. Dissertation Gothenburg, Sweden. ISBN 91–628–3194–1
17. King C A (1998) Suicidal behavior in adolescence. In: Maris R W, Silverman M M, Canetto S S (eds) Review of Suicidology. The Guilford Press, New York, pp 61–65
18. Kotila L, Lönnqvist J (1987) Adolescents who make suicide attempts repeatedly. Acta Psychiatrica Scandinavica 76:386–393
19. Larsson B, Melin L, Breitholtz E, Andersson M (1991) Short-term stability of depressive symptoms and suicide attempts in Swedish adolescents. Acta Psychiatrica Scandinavica 83:385–390
20. Laurant A, Foussard N, David M, Boucharlat J, Bost M (1998) A 5-year follow-up study of suicide attempts among French adolescents. Journal of Adolescent Health 22:424–430

21. Li G, Ling J, Di Scala C (1997) Characteristics and outcomes of self inflicted paediatric injuries: the role of method of suicide attempt. Injury of Prevention 3:115–119
22. Marttunen M J, Lönnqvist J K (1993) Adolescent and suicide: a review of psychological autopsy studies. European Child and Adolescent Psychiatry 2:10–18
23. Otto U (1972) Suicidal acts by children and adolescents. Acta Psychiatrica Scandinavica Supplement 233:1–123
24. Pfeffer CR, Klerman GL, Hurt SW, Kaukuma T, Peskin JR, Siefker CA (1993) Suicidal children grow up: rates and psychosocial risk factors for suicide attempts during follow-up. Journal of the American Academy of Child and Adolescent Psychiatry 32:106–113
25. Sakinofsky I (2000) Repetition of suicidal behaviour. In: Hawton K, van Heeringen K (eds) The International Handbook of Suicide and Attempted Suicide 2:385–404. ISBN 0–471–98367–5
26. Schmidtke A, Bille-Brahe U, De Leo D, Kerkhof A, Bjerke T, Crepet P, Haring C, Hawton K, Lönnqvist J, Michel K, Philippe A, Pommereau X, Querejeta I, Salander-Renberg E, Temesváry B, Wasserman D, Fricke S, Weinacker B, Sampaio-Faria J (1996) Attempted suicide in Europe: rates, trends and sociodemographic characteristics of suicide attempters during the period 1989–1992. Results of the WHO/EURO Multicentre Study on Parasuicide. Acta Psychiatrica Scandinavica 93:27–338
27. Spirito A, Lewander W, Levy S, Kurkjian J, Fritz G (1994) Emergency department assessment of adolescent suicide attempters: factors related to short-term follow-up outcome. Paediatric Emergency Care 10:6–12
28. Suokas J, Lönnqvist J (1995) Suicide attempts in which alcohol is involved: a special group in general hospital emergency rooms. Acta Psychiatrica Scandinavica 91:36–40