Adolescent Suicide in Quebec and Prior Utilization of Medical Services

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ABSTRACT

Background: Psychopathology is the main risk factor for adolescent suicide but several studies have shown that only a small proportion of suicide victims receive mental health care during the months preceding their suicide. The goal of this study is to describe the utilization of medical services by Quebec adolescent suicide victims during the year preceding their suicide.

Methods: All suicides of persons aged 19 or less that occurred during a five-year period were retrieved from the Quebec Coroner's database. Corresponding medical services utilization data were retrieved from the Quebec physician payment database (RAMQ) and the Quebec hospitalization database (MED-ECHO). Data were analyzed in terms of types and intensity of medical services (physical or psychiatric), types of providers (general practitioners, psychiatrists, and other medical specialists), and timing of interventions relative to the date of suicide.

Results: 78% of all Quebec adolescent suicide victims utilized medical services during the year before their suicide. However, only 12% of all victims received medical attention for psychiatric problems, and only 9.9% met with a psychiatrist during that same period of time. General practitioners and non-psychiatric medical specialists provided medical attention for psychiatric problems to only 5.6% and 0.7% of those future suicide victims with whom they met in outpatient settings, and the intensity of their interventions was low.

Interpretation: These results suggest that the level of recognition and treatment of psychopathology in Quebec adolescents who later commit suicide is low, despite the fact that a large proportion of them meet with physicians during the year preceding their suicide. This suggests that information and training programs pertaining to adolescent suicide and psychopathology should be implemented for GPs and non-psychiatric medical specialists as well.

La traduction du résumé se trouve à la fin de l'article.

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The incidence of adolescent suicide in Quebec is the highest among Canadian provinces. In 1996, suicide accounted for 38.3% of deaths within the 15-19 age group, representing the first cause of death. The rate of suicide for that same age group was 20.7 per 100,000 in Quebec compared to 11.5 in Canada as a whole,¹ even if Quebec's proportion of Aboriginal people, who are afflicted by very high suicide rates, is much lower than Canada's (1.0% vs. 2.8%).² Risk factors for adolescent suicide have been documented in numerous studies (as reviewed by Brent³). First and foremost, psychopathology – including affective disorders, substance abuse, disruptive disorders, personality disorders, schizophrenia, as well as traits of impulsivity and aggressivity – has been shown to be present, often in comorbidity, in up to 90% of adolescent suicides.³ Moreover, a large proportion of those victims were ill for a long time when they committed suicide: in the two studies reviewed by Brent,³ psychopathology was present for more than one year in 82% and 84% of subjects, and for more than three years in 58% and 68% of subjects.

Numerous studies have shown that psychopathology remains undetected and untreated in a large proportion of completed suicides, both in adults⁴⁻⁷ and adolescents.^{8,9} This is not surprising, given that more than 50% of all adult depressions in primary care remain undetected, and that only a small proportion get appropriate treatment.¹⁰ This may be even worse in the case of adolescent depression, given the presumably lower level of awareness of physicians for that condition, its sometimes atypical symptomatology (i.e., rapid mood fluctuation, troubled behaviour, etc.), adolescents' reluctance for spontaneously sharing their hopelessness with adults, and the short time frame of medical encounters.

The goal of this descriptive study is to characterize the utilization of medical services – for both physical and mental health problems – by Quebec adolescent suicide victims during the year before their suicide. Results of similar studies conducted in different contexts vary widely, presumably in relation to national differences in accessibility to health care. For instance, 64% of Runeson's adolescent and young adult subjects in Sweden had received mental health treatment during the year

preceding their suicide.¹¹ That proportion was 7% and 20% – during the three months preceding suicide – in two US studies reviewed by Brent.³ In the UK, two thirds of Barraclough et al.'s adult subjects had seen a family physician in the month before their suicide, and 40% in the week before.⁴ Such discrepancies justify new measurements in specific contexts.

METHODS

After approval of the protocol by the Quebec "Commission d'accès à l'information", all cases of completed suicides by Quebec adolescents (age less than 19) that occurred during the five-year period between January 1, 1992 and December 31, 1996 were retrieved from the Quebec Coroners Office. That period was chosen in order to ensure completeness of data collection, since coroners' investigation reports may take some time to be completed and entered into their database. Quebec coroners are generally certified physicians, some being lawyers, with specific training in forensic medicine and law. All deaths from non-natural or unknown cause are investigated. In complex cases, coroners may obtain additional expertise from senior personnel belonging to the Central Office. A death is classified as a suicide based on the World Health Organization's criteria.¹² This is determined from police information, autopsy results, past and current medical history, as well as interviews with witnesses and persons from the victim's environment. We are not aware of independent validation studies of Quebec coroners' suicide investigations. The procedure is probably more specific than sensitive since it is likely that a certain number of suicides are classified as accidents when evidence is lacking. False positives are probably very rare.

For each suicide, the following information was extracted from the Quebec Coroners Office computerized database: date of birth, sex, date of event (i.e., date of suicide), date of death, and means of suicide. The names and health insurance numbers of the victims were used for retrieving information about medical services from the physician fee-for-service payment database of the "Régie de l'assurance maladie du Québec" (RAMQ), and about hospitalizations from the MED-ECHO database of the Quebec Ministry

TABLE I

Suicides of Persons Under 19 That Occurred in Quebec Between January 1, 1992 and December 31, 1996, by Age, Sex and Means of Suicide

Means of suicide	Males Age (SD) 16.4 (1.6) N (%)	Females Age (SD) 15.8 (1.9) N (%)	All Subjects Age (SD) 16.3 (1.7) N (%)
Hanging	169 (51%)	64 (63%)	233 (54%)
Firearm	111 (33%)	10 (10%)	121 (28%)
Trauma	32 (10%)	14 (14%)	46 (11%)
Intoxication	17 (5%)	11 (11%)	28 (6%)
Other means	5 (1%)	2 (2%)	7 (2%)
All means	334 (77%)	101 (23%)	435 (100%)

TABLE II

Medical Visits (Excluding Hospitalizations) During the Year Preceding Suicide, by Type of Visit and Medical Speciality of Attending Physician

Type of Visit		Medical Speciality of Physician			
		GP	Psychiatrist	Other	All Specialities
Physical	Number of visits	1206	4	415	1625
	Number of subjects	318	4	146	335
	Visits/subject (mean)	3.8	1	2.8	4.9
	Visits/subject (median)	3	1	2	3
	Visits/subject (range)	1-44	1-1	1-28	1-73
Psychiatric	Number of visits	29	554	1	584
	Number of subjects	18	38	1	47
	Visits/subject (mean)	1.6	14.6	1	12.4
	Visits/subject (median)	1	4.5	1	3
	Visits/subject (range)	1-4	1-117	1-1	1-118
All visits	Number of visits	1235	558	416	2209
	Number of subjects	319	38	146	340
	Visits/subject (mean)	3.9	14.7	2.8	6.5
	Visits/subject (median)	3	4.5	2	3
	Visits/subject (range)	1-48	1-117	1-29	1-121
No visit	Number of subjects				95

of Health and Social Services (MHSS). These data were retrieved for a one-year period before suicide, using the date of departure in the case of hospitalizations. All precautions were taken in order to protect nominal information as required by the Quebec *Law on Access to Information*.

In 1999, fee-for-service accounted for 79.2% of general practitioners' payment, 65.9% of psychiatrists' payment, and 86.1% of other medical specialists' payment.¹³ These proportions were slightly higher in 1995 and 1996.¹³ Our results may thus underestimate *outpatient* medical services provided to suicide victims. For psychiatrists and other medical specialists, the underestimation is probably negligible since *inpatient* medical services, which are captured by our MED-ECHO hospitalization data, account for up to 90% of *non* fee-for-service payment, the remaining 10% being mostly related to administrative activities. For general practitioners, given the differential productivity ratios of fee-for-service vs. *non* fee-for-service providers, the worst possible underestimation may be around 10%. Given the results that will be presented later, this will not impact on our interpretation in any way.

The utilization unit for outpatient medical services, that we call "medical visit" in what follows, groups all outpatient services provided by a single physician to a single patient during one calendar day. A medical visit is classified as "psychiatric" if it includes at least one mental health evaluation or intervention, and as "physical" otherwise. Hospitalizations from the MED-ECHO database are classified as "psychiatric" if they include at least one mental health diagnosis,¹² and as "physical" otherwise. All data were entered into a relational database and descriptive statistics were produced with the SPSS® program.

RESULTS

During the five-year period between January 1, 1992 and December 31, 1996, 435 persons under 19 committed suicide in Quebec, 334 males and 101 females (male/female ratio: 3.3:1) (Table I). Mean age at date of suicide was 16.3 (range 11-18) and there was no significant age difference between males and females. Hanging was the most frequent means of suicide (54%), followed by firearm (28%), trauma (11%), and intoxication (6%). Firearms

TABLE III
Hospitalizations During the Year Preceding Suicide, by Type of Problem

	Type of Problem		
	Physical	Psychiatric	All Problems
Number of hospitalizations	40	49	89
Number of subjects	35	26	56
Hosp./subject (mean)	1.1	1.9	1.6
Hosp./subject (median)	1	1	1
Hosp./subject (range)	1-3	1-9	1-11
No hospitalization	No. of subjects		379

TABLE IV
Last Medical Services During the Year Preceding Suicide, During the 90 Days Preceding Suicide, During the 30 Days Preceding Suicide, and During the Week Preceding Suicide, by Type of Service and Type of Problem

Period Type of Problem	Medical Visits			Hospitalizations	All Services
	GP	Psychiatrist	Other		
1 year					
Physical	241	0	58	12	311 (91%)
Psychiatric	5	16	0	8	29 (9%)
All problems	246 (72%)	16 (5%)	58 (17%)	20 (6%)	340 (78%)
90 days					
Physical	117	0	37	5	159 (86%)
Psychiatric	5	15	0	6	26 (14%)
All problems	122 (66%)	15 (8%)	37 (20%)	11 (6%)	185 (43%)
30 days					
Physical	48	0	19	4	71 (74%)
Psychiatric	5	13	0	6	25 (26%)
All problems	53 (55%)	13 (14%)	19 (20%)	10 (11%)	96 (22%)
1 week					
Physical	18	0	10	4*	32 (70%)
Psychiatric	2	8	0	4*	14 (30%)
All problems	20 (44%)	8 (17%)	10 (22%)	8 (17%)	46 (11%)
Total number of suicides					435 (100%)

* Three patients in each of these two groups were hospitalized at the time of their suicide

were used by a higher proportion of males (33%) than females (10%).

340 suicide victims (78% of all victims) had at least one outpatient medical visit during the year before their suicide (range 1-121) (Table II). 73.3% of all suicide victims (319/435) met with a general practitioner, 8.7% (38/435) met with a psychiatrist, and 33.6% (146/435) met with other medical specialists. The average number of visits per subject was higher with psychiatrists than with other types of physicians ($p < 0.05$). Only 47 subjects (10.8% of all victims) received medical attention for a psychiatric problem, mostly by psychiatrists (8.7%: 38/435) and general practitioners (4.1%: 18/435). Only 5.6% (18/319) of those subjects who met with a general practitioner and 0.7% (1/146) of those who met with a non-psychiatric medical specialist received medical attention for a psychiatric problem. The proportion of outpatient medical visits involving a psychiatric evaluation or intervention was very low for both general practitioners (2.4%: 29/1,206) and non-psychiatric medical specialists (0.2%: 1/415).

As shown in Table III, 56 suicide victims (12.9% of all victims) were hospitalized during the year before their suicide. 5.9% of all suicide victims (26/435) were hospitalized with a psychiatric diagnosis (but these hospitalizations could also include physical diagnoses), and 8% (35/435) were hospitalized for exclusively physical conditions. A small number of patients were hospitalized repeatedly, mostly for psychiatric conditions.

Considering outpatient medical visits and hospitalizations together, only 12% of all suicide victims (52/435) received medical attention for a psychiatric problem during the year preceding their suicide. Assuming that patients who were hospitalized with a psychiatric condition were seen by a psychiatrist, only 9.9% (43/435) of all suicide victims met with a psychiatrist during the year preceding their suicide. Among those victims who met with a physician at least once during the year preceding their suicide, 84.7% (288/340) did not get medical attention for a psychiatric problem.

As shown in Table IV, 11% of all suicide victims (46/435) met with a physician

– either in outpatient or hospitalization settings – during the week before their suicide, 22% (96/435) during the preceding month, 43% (185/435) during the preceding three months, and, as mentioned earlier, 78% (340/435) during the preceding year. Six patients committed suicide while they were still hospitalized. Distributions of those last medical encounters vary in function of their temporal proximity to suicide. Not unexpectedly, the proportion of subjects who received medical attention for a psychiatric problem when they last met with a physician (and the proportion of subjects who were last seen by a psychiatrist) tends to increase with shorter delays to suicide, from 9% (29/340) (one year or less before suicide) to 30% (14/46) (one week or less before suicide). The proportion of hospitalizations also increases with shorter delays to suicide. However, the largest proportions of these last medical encounters involved general practitioners and physical problems, except during the last week before suicide.

DISCUSSION

It was shown in previous research that a large proportion of adolescent suicide victims suffer from various forms of psychopathology, and that most of the time they have been ill for more than one year when they commit suicide. Psychopathology is also generally recognized as the most important risk factor for suicide, and proper diagnosis and treatment of mental illness represent major components of suicide prevention strategies.^{14,15} This study shows that during the year preceding their suicide, only 12% (52/435) of all Quebec adolescent suicide victims received medical attention for a psychiatric problem, and only 9.9% (43/435) met with a psychiatrist over that same period of time. For reasons that were mentioned before, these proportions may be somewhat underestimated, which does not impact on our interpretation.

Considering that at least 78% (340/435) of subjects met with a physician during the year preceding their suicide, and at least 43% (185/435) during the preceding three months (which, again, may be somewhat underestimated), there seems to be ample room for improvement of physicians' detection of mental health problems in

adolescents who are at risk for suicide. This applies to both general practitioners and non-psychiatric medical specialists who provided medical attention for psychiatric problems to only 5.6% (18/319) and 0.7% (1/146) of those future suicide victims with whom they met in outpatient settings.

Our data do not reveal much about the nature and appropriateness of mental health services that were provided to future suicide victims, except that the intensity of medical interventions, in terms of the average and median number of outpatient visits per subject, was quite low in a very large proportion of the cases. Results from other studies suggest that diagnostic and therapeutic interventions that are provided to future suicide victims are frequently inadequate.^{8,9} However, a series of studies by Rutz¹⁶ suggest that an intensive educational intervention aimed at general practitioners on the detection and treatment of depression has led to a 30% to 60% reduction of suicides in the Swedish island of Gotland. More indirectly, Isacson¹⁷ argues rather convincingly that the 3.5-fold increase in the use of antidepressants in Sweden between 1991 and 1996 may have contributed significantly to the 19% decrease in suicide rate that was observed over the same period of time. These two studies did not specifically consider adolescent suicides but they suggest that better recognition and medical treatment of depression may play an important role in reducing adolescent suicide rates as well.

In conclusion, despite the fact that a large proportion of Quebec adolescent suicide victims has met with a physician during the year before their suicide, the level of recognition and treatment of their mental health problems seems to be alarmingly low. Many factors could be involved but we suggest that information and training programs pertaining to adolescent psychopathology and suicide should be implemented for general practitioners and non-psychiatric medical specialists as well. This, along with other suicide prevention strate-

gies, may contribute to reduce the suicide rate of Quebec adolescents towards the lower levels that are usually found in comparable jurisdictions.

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RÉSUMÉ

Contexte : La maladie mentale constitue le principal facteur de risque du suicide chez les adolescents, mais plusieurs études ont montré qu'une faible proportion seulement de ces victimes de suicide avait reçu des services de santé mentale au cours des mois précédant le suicide. L'objectif de cette étude est de décrire l'utilisation des services médicaux par les adolescents québécois s'étant suicidés, au cours de l'année précédant leur suicide.

Méthode : Tous les cas de suicide de personnes de moins de 19 ans s'étant produits au Québec sur une période de cinq ans ont été extraits des bases de données des coroners. Les données sur l'utilisation des services médicaux par les victimes ont été extraites des bases de données sur le paiement des médecins de la Régie de l'assurance maladie du Québec (RAMQ) et des bases de données sur les hospitalisations au Québec (MED-ECHO). Ces données ont été analysées selon le type et l'intensité des services médicaux reçus (physiques ou psychiatriques), le type de dispensateur de soins (omnipraticien, psychiatre ou autre médecin spécialiste) et la chronologie des interventions en rapport avec la date du suicide.

Résultats : Soixante-dix huit p. cent des adolescents québécois s'étant suicidés ont eu recours à des services médicaux au cours de l'année précédant leur suicide. Cependant, seulement 12 % de ces adolescents ont reçu des services pour des problèmes psychiatriques, et seulement 9,9 % ont rencontré un psychiatre au cours de cette période. Les omnipraticiens et les médecins spécialistes non psychiatres ont fourni des services pour des problèmes psychiatriques à respectivement 5,6 % et 0,7 % des futures victimes de suicide qu'ils ont rencontrées en externe, et l'intensité de ces services a été très basse.

Interprétation : Ces résultats donnent à penser que le niveau de reconnaissance et de traitement médical des problèmes de santé mentale chez les adolescents québécois qui vont se suicider est bas, bien qu'une grande partie d'entre eux rencontrent un médecin au cours de l'année précédant le suicide. Ceci suggère que des programmes de formation sur le suicide et la santé mentale des adolescents devraient être offerts aux omnipraticiens et aux médecins spécialistes non psychiatres.