

Collective Expert Report

Suicide

Psychological autopsy, a research tool for prevention

Summary

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Synthesis

Suicide constitutes a major public health problem. It is a manifestation of self-destructive behavior that results from a crisis situation often not sufficiently recognized by relatives and friends or by the medical profession. It affects all age categories and both sexes. Suicide attempts are at least 10 times more frequent than fatal suicides and repeated attempts are common.

According to the World Health Organization, approximately one million people die by suicide worldwide every year and the phenomenon is constantly and globally on the increase. This plague affects all countries in varying degrees. The suicide rate varies from 0.5/100,000 in Jamaica to 75.6/100,000 in Lithuania for men and from 0.2/100,000 in Jamaica to 16.8/100,000 in Sri Lanka for women.¹

In France, the estimated number of suicides is about 11,000 per year. This represents 2 % of the annual death toll, which is in the upper average relative to other European countries. It is the second cause of mortality among 15-44 year olds after road accidents and the first cause of mortality among 30-39 year olds. While the proportion of suicides thereafter diminishes significantly with age, the number of deaths by suicide increases markedly. Indeed the rate of fatal suicides is 6 times higher among the aged over 85 than among 15-24 year olds. In 1999, the last year for which prevalence figures are known, suicide rates for the population as a whole were 26.1/100,000 for men and 9.4/100,000 for women. In addition, there are strong geographical discrepancies, with higher suicide prevalence in northwestern regions of France.

Analyzing mortality data enables one to evaluate the suicide situation in a particular country in relation to the rest of the international community or establish the suicide burden among the causes of death of certain population categories, such as teenagers. To do this, gathering statistical data on the population deceased by suicide requires that one takes into account the medical causes of death reported on death certificates. Should suicide not be explicitly mentioned, the prevalence of death by suicide may be underestimated. Sporadic investigations involving medico-legal institutions and conducted by Inserm's CépiDC (Epidemiological Center for Mortality by Medical Causes)² have evaluated that 1998 suicides in France were under-declared by 20 %.

Suicidal conduct presents a number of very heterogeneous phenotypes. "Suicidal behavior" usually refers to a whole variety of conducts that include suicide "attempts" (defined as an intentional gesture aimed at dying and requiring evaluation or medical treatment) and suicide as such. Suicidal behavior may be classified according to the subject's intentionality (desire to escape, vengeance, altruistic suicide, risk taking, ordalic behavior, self-sacrifice), suicidal ideation, means of suicide (violent or non-violent), degree of lethality (with or without necessity for intensive care hospitalization), the degree of alteration of cognitive function (aggressive and impulsive behavior), aggravating or triggering circumstances (mental confusion, intoxication, specific sociodemographical context) and the presence of psychiatric or other comorbidities.

¹ <http://www.who.int/mental-health/prevention/suicide/suicideprevent/en/>

Some countries deny the phenomenon and publicize unduly low or even nil suicide rates.

² Centre d'épidémiologie sur les causes médicales de décès

Predictability of suicidal action is very uncertain and numerous authors agree to say it is impossible to draw a precise portrait of the suicidal subject. Nonetheless, various risk factors have been identified over time, in particular by using the technique known as psychological autopsy. This technique is practiced in a number of countries such as Canada, Great Britain and Finland but is still virtually unpublicized in France. The aim is to reconstitute the psychological, social and medical circumstances of death of a person who has committed suicide by collecting data, especially among friends and relatives. This can then be used in research efforts to improve our knowledge of risk factors in suicidal behavior and develop prevention.

Psychological autopsy: a meticulous, complex and multidimensional investigation of suicide

The principle of psychological autopsy is based on the meticulous collection of data that are likely to help reconstitute the psychosocial environment of individuals who have committed suicide and thus understand better the circumstances of their death.

The first authors to use this method did so for medical and legal reasons, particularly when the causes of death were ill-defined. The method was later applied to suicide prevention, crisis intervention, or research both to improve existing knowledge and identify subjects “at risk” of committing suicide. Thus, among studies using the method of psychological autopsy it is important to distinguish those that are aimed at studying individual cases from wider-scope studies designed to pursue particular research goals.

In a research-specific context, psychological autopsy appears to be a useful tool first of all to shed light on suicidal behavior and thus develop prevention. The design of such research therefore depends on the specific questions and hypotheses it is meant to address.

From the methodological point of view, psychological autopsy appears to be a complex and multidimensional strategy. In the first place, “cases” must be defined with a great deal of care in order to constitute homogeneous samples made up of verified suicide cases, particularly in view of the fact that in many countries suicide is not recorded as such.

For the most part, the method is based on collecting information by interviewing people connected with the subject who committed suicide. In this type of approach, it is obviously useful to have a great variety of information sources. The methods involved take into account the circumstances of death as well as the medical data obtained from the family doctor and other official sources.

Being the most likely to provide accurate and reliable information, the suicidee’s friends and relatives are a crucial source. However, contacting such people, who are naturally bereaved, in order to collect information can raise a large number of questions from a methodological, practical and ethical point of view.

It appears increasingly necessary to standardize the methods by which such data are collected. A sketchy standardization already exists in the form of various methodological items such as a letter followed by a telephone call. This is the most frequently used approach in research studies. The best time to contact friends and relatives has been established to be between 2 and 6 months after the suicide event. The time lapse to be observed should allow the more painful mourning period to have past while not letting interviewees’ memories become exceedingly altered.

This type of working procedure must definitely be validated by competent ethical committees. It is also highly important that the informants feel at ease with the investigators,

that they know they are being respected and understand why their contribution is of particular interest for research. When using the results, it is important to respect the informants' anonymous status, their right to interrupt their participation at any time and have the possibility to destroy the recorded information that involves the informant in order to optimize the interviewing process and ensure result quality.

As rigorous as such data collection might be, this type of methodology depends on getting indirect information from a third party and is consequently exposed to structural bias. This introduces some degree of subjectivity, which may influence the validity and reliability of the information gathered by interview. One way of reducing such bias is to interview a number of friends and relatives for each suicide case.

In future, one should ensure that the studies are tightly controlled in spite of the difficulties such methodology might raise. Control groups should be specifically set up in terms of the working hypothesis. Under certain circumstances, setting up more than one control group might be useful or even indispensable. Interviewees should always be people that are closely connected with the control subject, since using the latter as an informant seems inappropriate. Regarding methodological procedure, it is important to consider that the control group is made up of people who are alive, which introduces a built-in bias. It is therefore highly desirable to set up a control group of people that have committed suicide – but do not obey the criteria to be included as “cases” in a given study – and run research interviews of their friends and relatives.

Studies involving psychological autopsy gather information on a large number of parameters including details about the person's death, family background, social context, life trajectory, social interaction, working conditions, physical/mental health and history, previous suicidal behavior if any, negative elements in the person's life, contact if any with help line services before committing suicide and reaction of friends and relatives to the suicide. The different systems that can be used to achieve this are not necessarily based on strict guidelines. Indeed, studies have revealed significant differences in the way interviews are conducted in the absence of a prevailing standard, even though pioneering studies often serve as templates for the more recent studies. Studies based on evaluation naturally structure interviews and allow full coverage of various clearly formulated issues. However, here again, standardization is lacking when it is in fact crucial.

Nonetheless, while collecting data demands a rigorous approach, a degree of flexibility in the interviewing process is desirable in order to take into account the psychological needs of bereaved friends and relatives. Beyond serving the immediate goals of the study, it is necessary to find a suitable compromise between the investigators' need for rigorous methodology and a necessary adaptability on the part of the clinical personnel involved. Besides the general principles of “good clinical practice” that normally prevail in this type of research, additional principles must be respected because of the psychological nature of such clinical practice. Indeed, the psychological autopsy technique is a special case in that it is not only a research tool, but also a psychological intervention and therefore belongs to the therapeutic field. The interview undeniably has an impact on the mourning process of the people close to the dead person, which can reactivate the trauma and elicit emotional upset...

Interviewers are usually psychologists or psychiatrists. It is recommended they have clinical training, good knowledge of social work and a good capacity for empathy without being overwhelmed by their own emotions. Supervision appears to be necessary with regard to both research and the psychodynamic aspect. Research work should be associated with a center where the interviewed person can be referred if specific treatment turns out to be necessary.

So far, the available data on psychological autopsy enables one to define a few guidelines to produce quality studies in future. These guidelines include the necessity to constitute samples of more than 60 cases in order to be able to draw general conclusions and thus test the primary hypotheses of a research program. In this respect, it is crucial to define clearly the initial hypotheses, protocol and diagnostic criteria as well as the precise characteristics of the sample. Case definition, the constitution of control groups and the qualifications of intervening personnel are all important elements. Finally, a cautious evaluation of the quality of the data collected is essential.

Psychological autopsy allows identification of recurring factors associated with suicide

Numerous epidemiological investigations (prospective studies, cohort follow-up for patients that are hospitalized and/or present a particular pathology, retrospective studies based on medical history) have made it possible to establish that the majority of suicides occur in a context of psychological upheaval. Inasmuch as the author of the suicide is no longer able to answer the questions specialists wish to ask, most of our current knowledge stems from investigations involving people having committed suicide with no fatal consequences. Three points are worth making here:

- With respect to epidemiological studies, suicide and suicide attempts (SA) have often been described as very distinct phenomena. Now, it is becoming increasingly clear that they are not as independent of one another as one might speculate (increased risk of suicide as a function of the number of previous SA, covariance of suicide and SA levels), which might reflect the existence of a continuum of self-destructive behavior.
- The distinction between serious SA and suicide is gradually fading away due to the increasing efficacy of intensive care units. This supports the continuum hypothesis and reinforces the relevance of studies on serious suicide attempts in order to get a better handle on the risk factors for suicide.
- Nonetheless, the hypotheses on the convergence of these two phenomena do not reflect the fact that there are more men recorded in suicide statistics than women while women are more likely to be depressed and show a higher rate of SA. Now, epidemiological studies have shown that having a history of suicide attempts is the best predictive tool for subsequent fatal suicide.

While psychological autopsy was initially conceived as a medico-legal medicine tool involving a series of intensive interviews of people close to a person deceased under ill-defined circumstances, psychiatric investigators became interested in it as a means of characterizing the medical, psychological and possibly social or environmental context in which certain people had been lead to want to commit suicide. Very soon, the method revealed itself potentially useful in at least two different areas: the identification of risk factors (with clinical and/or preventive goals in mind) and research on biological markers and genetics (with a view to improve current knowledge). In addition, there was an interest in approaching the subject from a more quantitative point of view and recording the true number of suicides by interviewing relatives and friends of people deceased by violent death under ill-defined circumstances.

Psychological autopsy was developed by a limited number of teams in about 15 different countries but has remained for various reasons generally unpublicized in the majority of other countries including France.

At the beginning, psychological autopsies involved isolated cases only and were merely concerned with clinical analysis after a death occurrence.

Analyzing series of consecutive cases soon confirmed a prevalence of mental disorders (DSM-III-R axis I and/or axis II) in suicidal behavior in at least 90% of cases, irrespective of age or sex, as compared to 10-30 % for controls. Such prevalence levels confirm those observed in epidemiological studies. Though all mental disorders are represented, major depression seems to play the most important role. Meanwhile, the comorbidity between mental disorders and toxic substance abuse was found to be about 38 %.

From 1975 onwards, case-control studies were set up to compare series of subjects from the general population, which were matched for age, sex, and one or two characteristics of specific interest. Interviews became more structured owing to a battery of standard items bearing on the existence of mental disorder, comorbidity, history of suicide attempts, family history, as well as the individual's social environment. Thanks to this methodology, the difference between suicide cases (90 % mental disorder) and controls (27 % mental disorder) was confirmed. It is important to remember that case-control studies allow identification of risk factors at the population level and that risk factors are not a necessary parameter on an individual level. It is an associative measurement without causality content.

Studies on old people are few and far between and have mostly been carried out in the last ten years. The studies reveal that risk factors for men and women converge after 60. An Irish study showed that major unipolar depression (DSM-III-R axis I) is found in 77 % of cases. Material problems (financial, break-ups) are less important than for young people. On the other hand, feeling the loss a dear one or having to abandon an idea (that the family will always be there to help them), together with a history of suicidal behavior and low levels of social support, can generate episodes of major depression leading in some cases to suicide. Overall, general population studies have shown few qualitative differences in the nature of comorbid mental disorders. However, older subjects were significantly less likely to have declared their intentions than younger subjects.

Studies on young people who commit suicide (children and adolescents) not only show a strong prevalence of mental disorder, as seen in adults, but also a distinct presence of antisocial behavior (the difficulty to comply with rules and respect discipline) and unfortunate life circumstances. There is a strong correlation with depression, bipolar disorders, or excessive consumption of alcohol and various psychoactive substances. Negative life events are more numerous and stressful for young people in the week preceding suicide than for control subjects. Furthermore, psychosocial stress inducers are more often found for alcohol-dependent young people that commit suicide than their depressed counterparts, while the accumulation of stressful events in the absence of family support is prevalent in young people displaying addictive behavior. Finally, a recent American study reports the presence of a link between violence at school and suicidality.

In Finland, a comparison of youngsters of both sexes between the ages of 13 and 22 has shown that girls who have attempted suicide suffer more frequently from a serious psychopathology (mood disorders and acute depression in 68 % of cases) and have received psychiatric treatment (50 %), have a suicidal history (63 % against 30 % for control subjects) and are psychoactive substance abusers.

In the most recent psychological autopsies, calculating the prevalence of DSM-III-R axis I disorders is not the primary objective since the numerous conclusions in this area converge. Research on risk factors is more specifically focused on the following parameters:

- Axis II disorders and comorbidity;
- History of suicidal behavior;

- Psychosocial and/or environmental factors (family history of psychiatric illness or suicide, antisocial behavior, violence...);
- Contacts with the health care system (medical visits, hospitalizations, recording of depression) and detection of suicidal children or youngsters;
- Suicide attempts as a psychopathological marker;
- Impact of being told about having a serious or highly invalidating illness.

A small number of authors have noted a strong inter-cultural convergence but one should bear in mind that the entities evaluated in these studies are huge blocks of population (afro-Americans *versus* white Caucasians). The studies therefore require to be refined on a national level.

The working world is only represented in a handful of studies and bears essentially on doctors and nurses. Similarly, there are few comparisons between the rural and urban environment. Finally, there are not enough studies on suicidal behavior among veterans who have lived traumatic experiences.

Among the methodological limitations of the published studies, one should mention:

- Difficult access to data linked to possibilities for contacting friends and relatives;
- Ethical problems: contact modalities and timing with respect to bereavement;
- Time elapsed between suicide and the first and subsequent contacts (mourning period, time required for history reconstruction...), which should be determined for a given investigation;
- Sharing of information between professionals;
- Problems associated with recruiting controls, getting sufficient numbers of controls (a case-control investigation should comprise at least two or even three control subjects per case);
- Data asymmetry since controls, as opposed to the person who has committed suicide, are able to suggest who to interview;
- Reminiscence bias, which increases as interviews are delayed in time;
- Recruitment of age-matched older control subjects: younger controls will not be in a position to inform investigators about the suicidee's youth.

In any case, it is essential to underline that in future, psychological autopsies must be conducted using strict standard methodology under rigorous ethical conditions. Given the convergence of the majority of published results, one might question the relevance of further investigations unless they concern groups for which there is so far insufficient data or they explore new parameters of interest.

Psychological autopsy could benefit from knowledge on biological markers of suicide

The evaluation of biological markers for suicide prevention relies on measurement of biological parameters post-mortem or in patients having attempted suicide by violent means or otherwise. Studies on the biological modifications linked to suicidal behavior have yielded contradictory or uncorroborated results.

It would appear, on the one hand, that suicidal risk involves neurobiological determinants independent of psychiatric pathologies and, on the other hand, that vulnerability to suicide might result from an interaction between trait- and state-dependent factors that could themselves be influenced by triggering environmental factors. Certain neurobiological determinants may even influence trait- or state-dependent factors.

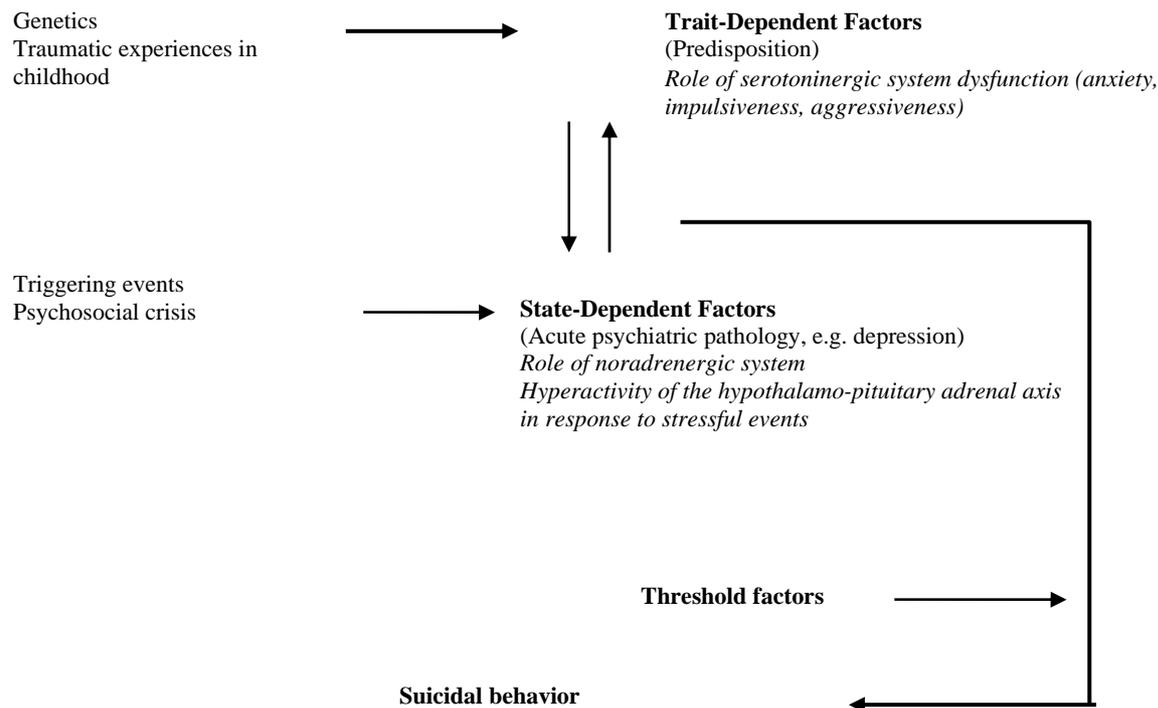
Trait-dependent factors appear to correspond to suicidal predisposition factors. They include clinical entities such as personality disorders, addictive behavior, and behavioral disorders such impulsiveness or aggressiveness. Such trait-dependent factors appear to be dependent on genetic factors and traumatic experiences, particularly in childhood, and seem to be aggravated by underlying serotonergic system dysfunction.

State-dependent factors appear to correspond to acute psychiatric pathologies (a serious depression episode, for example). They seem to depend on triggering events that cause psychosocial stress. Hyperactivity of the hypothalamo-pituitary-adrenal axis, which is directly implicated in stress, and noradrenergic system dysfunction might predispose subjects to react to stressful events.

Van Heeringen's model is based on the hypothesis that the threshold for suicidal behavior is linked to the way in which trait- and state-dependent factors interact.

The most thoroughly explored neurobiological system is the serotonergic system. Studies on the cerebrospinal fluid (CSF) and peripheral system of patients have been conducted post-mortem or after a suicide attempt. The arguments in favor of cerebral serotonergic system hypofunction are based on post-mortem analyses that show, on the one hand, a decrease in levels of serotonin (5-hydroxytryptamine or 5-HT) and its main metabolite, 5-hydroxyindole acetic acid (5-HIAA), in the hypothalamus and raphe region - but not in the prefrontal cortex - and, on the other hand, an increase in the number of serotonergic postsynaptic receptors 5HT_{1A} and 5HT₂ in the prefrontal cortex with a reduction in the number of presynaptic serotonin transporter sites compared to matched controls.

Numerous studies have found a lowering in the 5-HIAA CSF concentration in subjects having attempted suicide, especially by violent means. This anomaly is associated with self- and hetero-directed aggressive behavior and is more marked in impulsive subjects. Low 5-HIAA CSF concentration has been shown to be a predictive biological factor for suicidal risk and recurrent suicide attempts.



Van Heeringen model (2003) of interaction between trait- and state-dependent factors in suicidal behavior and the role of neurobiological factors

A decrease in prolactin secretion has been observed in subjects having attempted suicide as compared to controls after administration of fenfluramine (an indirect serotonergic agonist). This anomaly is a stable biological trait considered to be associated with depression, suicidal behavior and aggressiveness, and reflects a decrease in serotonergic system activity. In the peripheral system, a decrease in serotonin levels and in the number of serotonin transporter sites, which is also found in depression and aggressive behavior, was observed in blood platelets, together with a lowering in plasma 5-HIAA concentration. These peripheral system parameters evoke the anomalies observed in the central system.

In the noradrenergic system, post-mortem studies have revealed regional differences, with, on the one hand, a lowering of noradrenaline concentration (NA) in the cerebral trunk accompanied by a decrease in the number of noradrenergic neurons and an increase in the number of α_2 -adrenergic receptors and, on the other hand, an increase in NA concentration in the prefrontal cortex, together with an increase in the number of β -adrenergic receptors and a decrease in the number of postsynaptic α_2 -adrenergic receptors. These observations have been considered to reflect an increase in noradrenergic cortical activity. However, a decrease in growth hormone (GH) secretion has been observed in subjects having attempted suicide as compared to controls after administration of clonidine and is believed to be linked to noradrenergic hypofunction.

In the dopaminergic system, a few studies that have shown a decrease in the dopamine metabolite, homovanillic acid (HVA), in the CRF or 24-hour urine of subjects having attempted suicide. However, this needs to be confirmed.

In addition, the increase in urine cortisol (24-hour urine) and the observed hypercortisolemia after a dexamethasone suppression test reflect a hyperactivity of the hypothalamo-pituitary-adrenal system, which is implicated in the response to stress. Recent studies have shown that the association of the two above characteristics represents a 14-fold risk factor for suicidal behavior.

Finally, numerous studies have shown an important decrease in blood cholesterol in patients having attempted suicide, especially by violent means.

In summary, there seems to be an involvement of essentially three neurobiological systems in the pathophysiology of suicidal behavior:

- The serotonergic system, which appears to be associated with disorders in the regulation of anxiety, impulsiveness and aggressiveness, is thereby implicated in trait-dependent risk factors;
- The hypothalamo-pituitary-adrenal axis (hyperactivity);
- The noradrenergic system (hyperactivity).

The last two systems seem to participate in the response to stressful events and are thus implicated in state-dependent factors.

On the basis of the above data, it is possible to formulate the hypothesis that neurobiological dysfunction could facilitate the appearance of suicidal behavior via abnormal modulation of basic neuropsychological functions.

The psychological autopsy technique, which is based on the analysis of the psychological and social circumstances of suicide, has revealed itself very useful over time to identify criteria of susceptibility to suicidal behavior. Combining this approach with analysis of biological factors, the involvement of which in suicidal behavior (especially violent suicide) is now well documented, might improve the performance in screening for suicide probability and thus participate in its prevention.

Biological markers and suicide

Biological markers	Type of analysis	Results
Serotonin (5-HT)	<i>Post mortem</i>	<ul style="list-style-type: none"> ↘ 5-HT and 5-HIAA catabolite (raphe region, hypothalamus) ↘ 5-HIAA in prefrontal cortex (inconsistent) Raphe region: ↗ 5 HT_{1A} receptors; no modification 5-HT transporter sites Nerve terminals: <ul style="list-style-type: none"> ↗ 5 HT_{1A} and 5 HT_{2A} post synaptic receptors in frontal cortex (controversial) ↘ 5-HT transporter sites (ventromedian prefrontal cortex)
	PET-SCAN (depression)	<ul style="list-style-type: none"> Raphe region: ↘ 5 HT_{1A} receptors; violent suicide particularly; bipolar pathologies Nerve terminals: <ul style="list-style-type: none"> 5 HT_{1A} receptors: ↘ in violent suicide particularly, bipolar pathologies and MDE 5 HT_{2A} receptors: no change or ↗ when high pessimism present or ↘ particularly in violent drug-induced suicide
	CRF	<ul style="list-style-type: none"> ↘ 5-HIAA levels, particularly in violent suicide. Negative correlation between 5-HIAA levels and impulsiveness. Predictive biological factor of suicidal risk
	Fenfluramine test	<ul style="list-style-type: none"> ↘ Plasma prolactin. Stable biological trait thought to correspond to a decrease in 5-HT system activity.
	Periphery	<ul style="list-style-type: none"> Blood platelets: ↘ 5-HT recapture ↘ Serotonin transporter sites, ↘ platelet 5-HT, ↗ 5 HT_{2A} receptors ↘ Plasma 5-HIAA, ↘ plasma tryptophan
Noradrenaline	<i>Post mortem</i>	Cerebral trunk: ↘ NA, ↘ NA neurons, ↗ α ₂ receptors

(NA)		Prefrontal cortex: ↗ NA, ↘ α_2 receptors, ↗ β receptors ↔ increase in cortical NA activity
	Clonidine test	↘ Plasma GH ↔ NA hypoactivity ↔ 2 opposed hypotheses
Dopamine (DA)	<i>Post mortem</i> CRF Periphery	Poorly studied ↘ HVA (controversial) ↘ HVA catabolite in 24-hour urine
Cortisol	Periphery	↗ Cortisol in 24-hour urine ↗ Plasma cortisol ← Dexamethasone suppression test, prediction of suicidal risk x14
Cholesterol		↘ Suicide, especially by violent means

MDE = Major depressive episode

Genetic vulnerability factors for suicidal behavior are partly independent from those for psychiatric pathologies

The phenotypic heterogeneity of suicidal conduct remains a major difficulty for developing a classification and analyzing the various risk factors involved. The data available on analyses of suicidal risk factors mainly come from studies that characterize suicidal behavior retrospectively, which leads to a number of problems. Retrospective characterization of the behavioral phenotype (axis I and II disorders, personality features, description of suicidal behavior...) can in some cases be affected by recall bias. Furthermore, in terms of phenotypic description the sub-group of subjects deceased by suicide remains particularly under-characterized.

Numerous arguments have afforded proof that there is a specific genetic vulnerability for suicidal behavior, independently of the known vulnerability for certain psychiatric disorders. In 1988, a study bearing on bipolar patients with a family history of bipolar disorder showed an association between family history of suicidal behavior and personal history of suicidal behavior. The same study showed that the inheritability of suicidal behavior is independent from that of mood disorders. In this respect, a study on the prevalence of suicides within the Old Order Amish community in Pennsylvania, which is well known for its alcohol prohibition, its non-violence and strong social cohesion, recorded 26 suicides in this community between 1880 and 1980. While 92 % of suicides involved people suffering from uni- or bipolar mood disorders and coming from families with a strong prevalence of mood disorders, numerous families with equally high prevalence for this type of disorder were free of suicide cases. Finally, about 8 % of suicides had taken place in families with no history of mood disorders.

Family aggregation studies report a prevalence of suicidal behavior that is 4 to 6 times higher in first-degree relatives of patients with a personal history of suicidal behavior compared to control patients. Twin studies have shown that concordance for suicidal behavior between homozygous twins was significantly higher than that observed for dizygotic twins. Finally, a study of adopted patients deceased by suicide shows that their biological relatives have a 6-fold higher risk of suicide than the biological relatives of adopted controls.

As mentioned previously, one of the major advances of biological psychiatry in the last 50 years has been to show that levels of the principal serotonin metabolite, 5-HIAA, were lower in the CRF of patients either deceased by suicide or having a history of attempted suicides, irrespective of the main psychiatric disorder they had been diagnosed with. According to certain authors, low levels of CRF 5-HIAA may even be predictive of suicidal behavior.

Molecular genetic studies (on the association between suicidal conduct and one or more candidate genes such as those coding for tryptophan hydroxylase – an enzyme involved in serotonin synthesis – or the serotonin transporter) have confirmed that genetic vulnerability factors for suicidal behavior are partly independent of those for psychiatric pathologies, which themselves are recognized as being responsible for a predisposition to suicidal behavior.

Nonetheless, studies have shown that the respective weight of the various polymorphisms analyzed remain relatively weak in determining suicidal conduct, which on the one hand confirms the multifactorial etiology of suicidal behavior and, on the other hand, reflects the probable interaction between several weak genetic factors and environmental and developmental factors. These observations suggest that for the moment, genetic studies cannot significantly improve the diagnostic value of psychological autopsy.

On the other hand, psychological autopsy tools are very useful in retrospective phenotypic characterization, thus allowing recruitment of homogeneous sub-groups of interest, for example subjects presenting serious suicidal conduct or deceased by violent suicide. Therefore, the analysis of phenotypic heterogeneity in suicidal behavior by psychological autopsy is of undeniable interest to further knowledge on genetic vulnerability to suicide and its interaction with other factors.

Recommendations

Working towards preventing suicide is clearly a priority in public health and the psychological autopsy technique can contribute in this area by helping to identify risk and triggering factors in given populations. This approach should also allow a better understanding of the complex interactions involved between the various parameters likely to affect suicide action.

ENSURE BETTER METHODOLOGICAL STANDARDISATION

A research study using psychological autopsy must, as in any scientific endeavor, ask a well-defined question and give itself the means necessary to fulfill its goals. In this respect, the psychological autopsy procedure has evolved over time as a result of the various studies conducted to date. The group of experts wishes to emphasize, however, that it would gain from being more rigorous and standardized in its implementation, particularly in the interview process with friends and relatives of the victim, which must at the same time be run with great caution from an ethical standpoint. Finally, the experts recommend that scientific evaluation of the data collected be systematically based on appropriate and validated psychometric scales.

RECRUIT APPROPRIATE CONTROLS

In the past, numerous studies were based on “case” analysis without including control groups. In order to improve performance in this type of work, the group of experts recommends that future studies using psychological autopsy be based on comparison with a sufficiently large number of control subjects, suitably matched with suicide subjects according to proper scientific criteria in order to fulfill the objectives and test the hypotheses of the study.

TAKE INTO ACCOUNT THE THERAPEUTIC OPPORTUNITY

The experts emphasize that psychological autopsy opens a new and different avenue from that of basic research inasmuch as it gives relatives and friends of the suicidee an opportunity to unburden themselves. Psychological autopsy can therefore represent an opportunity to approach and listen to the bereaved. Indeed, suicide remains a taboo within families, or even society at large, and a well-managed approach of this type could serve as a therapeutic tool the name and future of which remain to be invented. In this respect, the group of experts recommends that the interviewing process be entrusted to personnel comprising experienced psychologists or psychiatrists, capable of helping the mourning relatives and friends of a suicidee manage their emotions and go through the bereavement process.

TARGET FRENCH POPULATION CATEGORIES THAT HAVE HITHERTO BEEN UNDEREXPLORED

The numerous studies conducted to date do not involve samples of the French population but globally show a convergence of results, which suggests that the majority of observations may be transposed from one country to another. However, disparities can be observed when the studies involve specific populations. The group of experts therefore recommends that certain sub-populations (for example the young and the old) or groups of interest (homosexuals...), which remain underexplored in France, benefit from better evaluation of suicide risk thanks to knowledge acquired by psychological autopsy. Similarly, the influence of professional context in certain categories of the population also deserves to be further explored.

Finally, research of a similar scope but targeting subjects having attempted suicide without fatal outcome would be of great interest as part of a general prevention program.

COMBINE THE KNOWLEDGE ON BIOLOGICAL AND GENETIC FACTORS

Over the last few years, many studies have focused on exploring biological and genetic factors likely to be associated with suicide action. Current results clearly show there are neurobiological determinants and specific genetic factors, independent of vulnerability factors for psychiatric pathologies, that can influence suicidal behavior, and especially violent suicidal conduct. In this respect, studies have shown a hypofunction of the serotonergic system in subjects deceased by suicide. Such dysfunction causes a significant reduction in the levels of serotonin and its main metabolite, 5-HIAA, in certain regions of the brain, as well as a reduction in 5-HIAA in the cerebrospinal fluid. It is interesting to note that studies have revealed a substantial decrease in blood cholesterol and an increase in cortisol in patients having attempted suicide, generally by violent means. Concurrently, molecular genetic studies bearing on various gene candidates have shown that there are genetic vulnerability factors for suicide.

Until now, studies using psychological autopsy have not taken into account these factors, which are derived from a totally different field and may turn out to be very interesting. The group of experts recommends that future studies integrate the research on biological and genetic factors and insists on the necessity for regulations that would facilitate access to biological samples under conditions appropriate for research. Such studies could be conducted as part of multidisciplinary collaborative research projects.

Judging from the above studies, the experts emphasize that future studies using psychological autopsy and conducted on highly homogeneous population samples with well documented clinical, psychological, social and environmental profiles would be of great interest for the development of research on the genetic epidemiology of suicide.