An Overview of Suicide Study

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Abstract

Human suicide is a dangerous clinical event causing 2% of human mortality. Due to this dangerous and complex character, human suicide study is in a high demand now. A great sum of money and abundant human resources are allocated for the development of human suicide prediction, preventions and useful medical intervention. In order to promote this noteworthy subject, biomedical scientific study is indispensable. Historically, suicide knowledge was greatly based on mental illness study. Suicide/mood disorder diagnostics and treatments have been lasting over 2000 years (Hippocrates in 460 - 377, BC). From a long history of suicide/mood disorder association, the terminology aspects have been evolving greatly. Yet, diagnostic and therapeutic study is almost fruitless in mortality reduction. No 100% effective therapeutic means has been developed. To change this scenario, past history and literatures need to be carefully reviewed.

Keywords: *Suicide; Psychiatric Disease; Mood Disorder; Terminology; Diagnostics; Mental Illness; Suicide Mortality*

Introduction

Medical significance

Human suicide is a dangerous and complex event causing 2% of human mortality [1]. Due to this dangerous and enigmatic character, increasing human suicide study is indispensable. Apart from high mortality rates, a great sum of money and abundant human resources have to be allocated for human suicide prediction, preventions and useful medical managements. To promote this noteworthy subject, high-quality of medical investigation is underway [2-4].

Suicidal study scenario

A lot of different factors can lead to emergency of human suicide-environmental factor (outside) and viral/drug/genetic factors (inside) [5]. It has just recently discovered that human mental health problem may be a useful avenue for further clinical suicide study-including mood disorder, affective diseases, depressive disorders, schizophrenia and so on [6,7]. As a result, suicide knowledge should be based on scientific study and knowledge of both mental illness and other category for human suicide.

Early history

Earliest knowledge

Suicide/mood disorder diagnostics and treatments have been lasting over 2000 years (Hippocrates in 460 - 377 BC) [8,9]. From a long history of mood disorder studies, the diagnostic and therapeutic measures, especially terminology aspects have been gradually established. Yet, diagnostic and therapeutic controversies still remain. Great part of suicide/mood disorder diagnostics and therapeutics is unsatisfactory. No 100% effective targeted therapeutic drugs and modern technical-supportive diagnostic system has been established. To change this scenario, past history and medical literatures need to be carefully reviewed.

Timeline	Major discovery
Ancient Greece	Four elements and melancholy (excess of black bile)
Aretaeus of cappadocia	Clinical feature of depressive
Middle age	Patients with delusion
16th to 17th	Clinical diagnosis & behavior abnormal
18th	Nervous (animal spirits)
19th	Psychiatric symptoms
20th	Mood disorder and electroplexy and psychosurgery

Table 1: *Historic order of mood disorder knowledge discovery (suicide associated) [8].*

Current knowledge

Human suicide causality is arguable, yet widely disagreed now. Today, neuropsychiatric factors are noticeable as one of the main culprits for human suicidal events and mortality [6,7]. Table 2 shows a large clinical sample and data that display a strong association between suicide risks and other mental health problems.

Worldwide; totally 15,629 cases		UK; totally 4,859 cases	
Mood disorders	35%	Mood disorders	42%
Substance disorders	22%	Schizophrenia	20%
Personality disorders	12%	Personality disorders	11%
Schizophrenia	11%	Alcohol dependent	9%
Anxiety disorders	6%	Drug dependent	4%
		Anxiety disorders	3%
Other disorders	14%	Other disorders	11%

Table 2: *The associations between suicide and other diseases [5,6].*

From the diagnostic aspects, the symptoms of human suicide risks (hopeless feeling, self-blame and so on) are similar with symptoms of mood disorders (hopeless and helpless). The outside insults of environmental factors for suicide are also identical with factors of mood disorders-including marriage problems and job/family member losses.

Genetic and epigenetic

Since no conclusive outcomes for past suicide pathogenesis) study have been understood, the biomedical studies (genetic, molecular and cerebral image) are currently a convention for high-quality of suicide predictions, preventions and therapeutics [1,10-18]. It therefore supported the past hypothetic linkages between suicide and mental health problems by genetic and molecular analysis. As a result, more information associating mental disease diagnostics can be lent for suicide risks, predictions, preventions and therapeutic options.

Mental illness pathologic and diagnostic evolutions from historic achievements

Mood disorder is an old and serious type of diseases in an ancient discovery, initially noticed and described by the ancient Greek physicians over 2000 years (Hippocrates, 460 - 377 BC) [8,9]. As a main symptom of mental disorders, suicide has high mortality rate in the world. During the Hippocrates time, he found a symptom of "melancholia"-today "depression" (Unipolar disorder) and associated the disease root into human "brain dysfunction". Thousand years past, these statements had not been seriously challenged. We think that this discovery is still the core of future scientific and medical investigations.

The quests for suicide/mental illness relationships last from antiquity to modern era. During the long course of suicide/mental illness studies, the diagnostics are especially limited-act and symptoms (suicide attempts and repeats). Modern diagnostics is current research emphasizing [1,10-18]. Human suicides were previously treated and controlled by relevant chemical drugs, such as antidepressants [18-23]. However, these drug therapies like a double-edged sword that has both strengths and weaknesses. To overcome this setback, new therapeutics must be made.

Current achievements in diagnostics

Current routines neuropsychiatric diagnostics

Formally, worldwide diagnostic guidelines have been established and widely applied. Detail diagnostic information can be found in Diagnostic and Statistical Manual of Mental Disorder-from DSM-I to DSM-V of mental problems and Hamilton Depression Rating Scale (HAM-D) of suicide risks.

Diagnostic progresses for genetic and molecular technology

Psychiatric analysis is currently used as diagnostic means by clinicians or psychiatrists. They give medications only by analyzing patient's psychiatric conditions (different types of psychiatric illness score systems for depressive or manic symptoms) rather than patient's genetic predisposition such as pharmacogenetics (PG), genomic sequencing, bioinformatics profiling information or brain image/visual comparisons. They analyze patients from disease symptoms (suicide episodes) that mask the most important parts of disease originations and progresses (genetic/molecular-based causalities) in a series of pathogenesis stages or suicide-induced mortality. Across the long history of suicide/mental illness study, quick and proper diagnosis is the key. More recently, the morphological or visual scan of human brains of patients at high suicide risk began to emerge for disease progress determinations or multi-factorial etiological identifications [10-18].

The genetic changes in psychiatric diseases are enormous, such as UNC13A, NFASC, PTPRG, ERBB2, GR1N2A, HTR2A, DLG, ACTN, MYH9 and many others [24,25]. So far, at least 400 human genes are involved in neuropsychiatric disorders. A lot of scientific researches are needed.

Neuropathy study

To provide high-quality platform for human suicide study, neuropathy processes may be understood [26-28]. These complex processes have been explored over the past 2 decades due to technical updating (genetic or morphology). Many specific neural structural or functional elements or areas have been studied. This interesting topic may be as a fruitful discipline in the upcoming decades worldwide.

Therapeutic study and drug developments

Therapeutic study for neuropsychiatric diseases has been increased greatly. Possible therapeutic and drug design pathway is given in figure 1. In this stage, antidepressants (selective serotonin reuptake inhibitor, SSRI) are widely utilized in clinical trials and show therapeutic outcomes and benefits in the clinic [22].

Multiple confirmed alleles

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Systems analysis

(Protein-protein interaction)

↓

Targeted evaluation of models

↓

Convergent functional phenotypes

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Target development
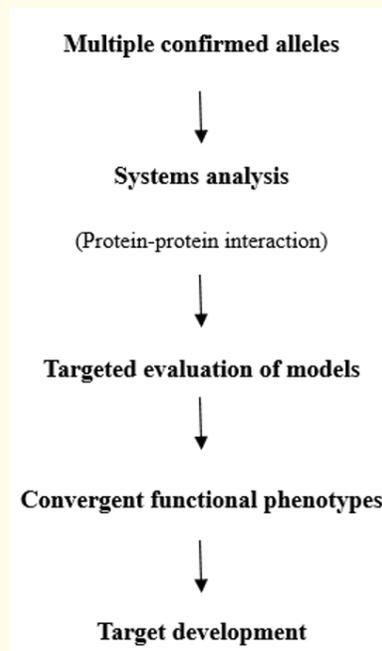
Figure 1: Therapeutic and drug design and developments [25].

Apart from drug treatment, other types of therapies, such as light therapy (physical treatment) are also useful for mood disorders or suicide patients [29].

Future Directions

Future directions into genetic/molecular-based diagnostics for suicide prediction and prevention system optimal are several types. From these efforts, patient's suicide risks might be quickly understood via high throughput and low cost diagnostics. Targeted drug therapeutics or other types of specific, highly effective interventions must be clinical implemented.

- Scientific testing, scoring and computational network for clinical data relationship buildup between disease causalities, progression, mortalities and possible drug targeting.

- Comparisons of different score algorithm or calculation systems and customize several workable paradigms for future clinical personalized medicine applications.
- Establishments of relationship between clinical diagnosis and treatments via modern technique-based ways (from genetic to molecular to visual or from visual to molecular or genetics).
- Increasing the accumulations of clinical genetic or molecular data (> 5000 clinical cases between patients at high suicide risks and normal persons).
- Collecting and evaluating the diagnostic relationship data between genetic polymorphism, chemical and environmental of multi-disciplines [24-33] (Figure 2).
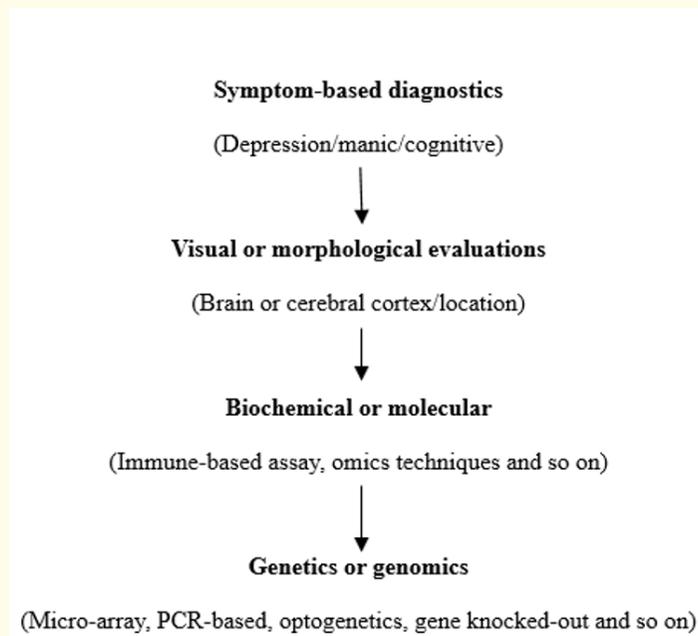
Figure 2: Possible diagram of suicide/mental disorder diagnostics evolutions [2].

Conclusion

Human suicidal predictions and preventions, especially diagnostic aspects of study must be greatly promoted and improved. It needs a great deal of comparative work in the clinic-including clinical diagnosis and effective targeted drugs for safeguarding medical interventions to patients at high suicide risks.

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