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Review Article

Diagnosing and dealing with childhood depression: A review

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ABSTRACT

Depression in children is a major health concern. This needs special attention: firstly, as this has been an area that has been understudied and secondly, due to the long-term consequences that follow. This entity has also been known to negatively affect the child's development and overall quality of life. This article aims at describing the concept and evolution of unipolar depression. The etiology, clinical features, sequelae and management of childhood depression have been discussed in detail. To conclude, childhood depression is an entity that is recurrent, associated with co-morbidity and results in long-term adverse sequelae. Hence, early identification and intervention are the core strategies.

1. Introduction

Before late 1970's children were considered as not being capable of experiencing symptoms of depression. However, research over the last 30 years has shown clearly that children also experience depressive symptoms although there are some differences in presentation as compared to adults. Studies in adult depression have revealed that the basis can be traced back to childhood experiences. Hence, it is essential to address these factors early and prevent continuation of symptoms into adulthood.

2. Historical perspective

In 1946, Spitz and Wolf[1] described a form of childhood depression. They observed that infants who were in the age range of 6–11 months developed adult like depressive symptoms when separated from their primary caregiver. The symptoms they reported in these infants were appearing sad, screaming, crying, reduced babbling, detachment from the environment and reduced physical activity. They were also noticed to have increased susceptibility to other inter-current illnesses due to lowering of immunity. This type of depression was referred to as 'anaclitic depression'.

Later Cytryn and Mcknew[2] reported symptoms of depression in children characterized by low mood, psychomotor retardation, hopelessness, social withdrawal and disturbances in sleep and appetite.

Weinberg et al[3] described criteria for diagnosis of childhood depression in children aged 6–12 years. They observed the following features in depressed children, a) There were apparent behavioral changes. Children either became more aggressive or withdrawn, b) They were observed to be hyperactive, c) There was increase in temper tantrums, enuresis and school phobia, d) Severe psychomotor retardation was absent e) Significant improvement was noticed with use of antidepressants.

The classificatory systems (DSM IV, DSM IV-TR, DSM-5 and ICD 10) have showed consensus between the similarities of childhood and adult depression. There have been no distinctions in diagnosis of childhood and adult depression though age related considerations have been specified.

3. Assessment

There are certain developmental challenges faced by the clinician while evaluating children with depression. Children often have difficulties to express or recall information. Hence other sources of information like parents and school teachers are important.

3.1. A developmental/clinical interview

A developmental perspective is taken into account in this interview. Developmental milestones in motor, cognitive, language, personal-social domains are taken into account. Thereafter, symptoms and signs of the disorder are taken into account keeping in view the interaction between life events. A detailed mental status examination is also done.

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3.2. A structured interview

These are used for research purposes. Child and adolescent psychiatric assessment (CAPA)[4] is used widely for research. Limitation of using structured interviews in children includes low reliability. Hence, it is suggested that till the age of 14 years interview with both the child and the parents is required.[5] Other methods of evaluating psychopathology in children aged below 10 years include puppet interviews[6] and structured pictorial questionnaire.[7]

3.3. Self and observer rating scales

Self-report scales are used to screen or monitor severity of signs/symptoms after the diagnosis is made. These scales have high sensitivity but low specificity. Among the observer rating scales, Children's Depression Rating Scale[8] and the Hamilton Depression Rating Scale[9] for depression are widely used.

4. Clinical characteristics

4.1. Epidemiology

The point prevalence for pre-pubertal depression has been found to be 1–2%. The prevalence estimates for adolescent depression as per National comorbidity survey-adolescent supplement has been found to be 7.5 and 11% for 12 month and lifetime prevalence respectively.[10]

4.2. Onset

It has been shown in studies that the risk of depression in children less than 9 years of age is extremely low. Thereafter, there is a rise in depression rates from 9 to 19 years of age with a female predominance.[11] Age at onset of depression has been reported to have an inverse relationship to the degree of family history of psychiatric disorders.[11] The incidence rates of depression have increased in youths and the age of onset has lowered over the years. This phenomenon is called as 'cohort effect'.

4.3. Natural course

Clinical research has shown that mean duration of an episode of depression is around 7–9 months[12] which is similar to that seen in adults. Around 90% of depressive episodes remit by 1.5–2 years after the onset with 6–10% becoming protracted.[13] Rates of recurrence of depressive disorders in children is 40% by 2 years and 70% by 5 years.[14] In adult depression there is around 70% recurrence reported in first five years of onset of the disorder.[15] Risk of developing mania/hypomania has been found to be 20–40% within 5 years of onset of major depression in adolescents.[16] Factors associated with increased duration of depressive episode include factors of chronicity, presence of comorbid disorders, increased severity of depressive episode, number of episodes in the past, having a family history of affective disorders and presence of ongoing stressors. Risk factors implicated include early onset depression, hopelessness, psychotic features, marked psychomotor retardation, family history of affective disorders (depression and bipolar disorder) and antidepressant-induced switch[17] (An episode of mania/hypomania that may occur during treatment with antidepressant medications).

4.4. Symptomatology

The clinical features of childhood depression[18] consist of persistent and pervasive sadness of mood, loss of interest in activities that are previously enjoyable and boredom. Other symptoms include tearfulness, difficulty in concentration, feeling worthless, feeling fatigued, changes in weight and appetite, school related difficulties (like academic decline, school refusal), temper tantrums and irritability. Weight loss has been seen more commonly than weight gain. As per Shaffer[19] a precipitating factor can be identified in majority cases of childhood depression. Features that will change with age are diurnal variation in low mood and expression of depressive thoughts.

It is important to differentiate depression from the normal "ups and downs" in life. The single most important factor that marks a distinction between the two is the level of functional impairment, which is mediated by factors of intensity and severity of depressive symptoms.

Comorbidity is more often than not found in childhood depression. Anxiety symptoms/disorder can occur prior to illness or during the depressive episode. Relationship of behavioral disorders like ADHD and conduct disorder is known to occur with ODD, which is a strong predictor of development of depression. Substance abuse is also known to be comorbid with depression e.g. alcohol, tobacco and cannabis abuse.[20]

4.5. Sequelae

Due to symptoms of depression children often have school absenteeism resulting in academic decline. Co-morbid psychiatric conditions, presence of family stressors further effects the psychosocial functioning of the individual.[21] Risk of suicidal behavior and substance abuse is also seen. Research data shows that even after recovery, there is persistence of sub-syndromal symptoms of depression, difficulties in interpersonal relationships and negative cognitions.

4.6. Etiology

Etiology of this disorder is multifactorial. There is an interaction between biological, psychological and social factors. These factors interact differently in different individuals and no one factor has been found to be primarily responsible. The same has been observed in adult depression. A detailed account of these factors has a role in treatment implication.

5. Biological factors

Family studies suggest a link between increased risk of psychiatric disorders in relatives of patients with depression. Family studies have found that children of depressed parents are three times more likely to develop depression as compared to children of parents without any psychiatric illness. The overall risk of developing a depressive episode in children of parents suffering from depressive disorder is considered to be 15–45%.[22] The risk increases when both parents suffer from mood disorder. Twin studies found 76% concordance rates for major depression in monozygotic twins as compared to 19% in dizygotic twins.[23] When monozygotic twins were brought up in different environments the rate decreased to 67%. This discrepancy is supported by the gene-environment hypothesis, which means that a depressed parent establishes a depressogenic environment causing the children to manifest the disorder.[24]

5.1. Molecular genetic studies

Emerging research evidence suggests role of underlying genetic mechanisms for negative thought processing of emotional stimuli that is located on promoter region of serotonin transporter gene (5-

HTTLPR). The function of the serotonin transporter gene is to remove serotonin both from the synapses and extracellular sites. Hence, the transporter works by reducing the levels of serotonin from these sites. The are two allelic variations i.e. the short and long alleles. Those with short allele of 5-HTTLPR gene have reduced activity of this transporter thereby leading to excess of serotonin in synapses and extracellular sites causing increased serotonin signaling. fMRI studies have also showed reduced functional coupling between the anterior cingulate cortex (ACC) and the amygdala. Hence, individuals homozygous for the 's' allele have increased reactivity in the amygdala in response to negative emotional stimuli and negative thought processing thereby predisposing them to depression. Research data evaluating the association between gene polymorphism and clinical symptomatology indicates that depressed children carry excess SS genotype followed by SL genotype.[25]

5.2. Neuroanatomy

A retrospective chart review study[26] of depressed children aged 3–17 years over a 5 year period who underwent MRI compared to control group observed a significantly greater size of lateral ventricular volume and lower ratio of frontal lobe: total cerebral volume.

The anterior cingulate cortex (ACC) has been found to be associated with depression. The subgenual region of ACC has been shown to have reduced volume in both childhood and adult depression.[27]

White matter hyperintensities are lesions in the brain that show increased brightness when visualized by T2-weighted MRI. Periventricular and deep white matter hyperintensities have been reported in mood disorders.[28] Amygdala and its related structures have also been reported in pathophysiology of depression. Thomas et al.[29] evaluated children with major depression aged 8–16 years and divided them into two groups-one with depressive disorder and another with anxiety disorder (consisting of generalized anxiety disorder and/or panic disorder). Both groups underwent fMRI viewing simultaneously series of neutral and fearful faces. Patients with depression showed reduced amygdala response in contrast to exaggerated response seen in those suffering from anxiety disorders.

Single photon emission computed tomography (SPECT) studies of patients with depression aged 11–18 years have shown significant areas of hypoperfusion in bilateral frontal, prefrontal and occipital lobes.[30]

5.3. Hypothalamic-pituitary axis

5.3.1. Dexamethasone suppression test (DST)

It has been seen that there is increase in glucocorticoid levels in response to stress in mammals. In normal individuals, increase in glucocorticoid levels leads to inhibition of ACTH secretion from the anterior pituitary via the feedback suppression loop and hence less steroids are secreted from the adrenals. DST is used to test the integrity of this feedback mechanism. Research of this mechanism in children suffering from depression revealed that 50–70% were non-suppressors on DST. Similar finding can be seen in individuals with current depression/past history of depression, presence of psychotic symptoms and family history of mood disorders.[31]

5.3.2. Growth hormone studies

In depression an altered Growth Hormone (GH) response is seen to pharmacological agents that usually increase GH secretion. Clonidine and insulin are examples of agents that are used to increase the GH secretion. These act on hypothalamus at postsynaptic alpha2 receptors. Both children and adults with depression show reduced GH secretion with these agents.[32]

6. Psychological factors

6.1. Patterns of thinking

Individuals with depression tend to have cognitive errors/biases that are negative views with respect to self, outside world and the future. Such errors in cognition/thinking particularly in stressful situations predict onset and progression of depressive symptoms. A particular cognitive style known as rumination, which is preoccupation with emotionally upsetting events, is also known to be associated with depression and more often seen in girls.[33]

6.2. Family environment

Certain factors relevant in the family context that have been postulated to play a role in etio-pathology of depression are interpersonal conflict, inadequate communication, rejection, abuse and lack of emotional support.[34] As mentioned above, presence of affective disorder in parent/s increases the risk of psychopathology in children chiefly by genetic predisposition.

6.3. Stressful life events

Studies have shown a significant relationship between depression and childhood and stressful life events. Maltreated children (including physical and sexual abuse) tend to develop insecure attachment, poor behavior and emotional regulation, decreased cognitive functioning, difficulties in adjustment to school and speech delays.[35]

6.4. Temperament

Certain temperamental traits are predictors for later development of psychopathology. Infants who show a low threshold of responsiveness when confronted with unfamiliar stimuli become subdued and tearful in early childhood. Anxiety and depression have be seen to be correlated with low scores approach/withdrawal, adaptability linking internalizing disorders with behavioral inhibition.[36] A prospective epidemiological study[37] showed that depression was associated with Cloninger's temperamental traits of shyness to strangers, sentimentality and persistence. Persistence is though considered to be associated with enthusiasm and positive coping but highly persistent individuals push themselves to an extent that is more than required, hence contributing as a risk factor for depression.

7. Management

Certain factors need to be kept in consideration in deciding management-these are the age of the patient, the developmental level, environmental factors e.g. presence of family conflict, school related problems, number of previous episodes, comorbid factors etc. Treatment strategies consist of pharmacological and non-pharmacological measures. Pharmacological treatment with selective serotonin reuptake inhibitors (SSRIs) is the treatment of choice in trials.[38] US Food and Drug Administration (FDA) has approved two SSRI's for treatment in children i.e. fluoxetine (approved in 2003) and escitalopram (approved in 2009). Fluoxetine is approved in children aged 8 years and older and escitalopram in children 12 years and older. Treatment with medications should continue for 6–12 months after the remission of depressive episode because of high rates of relapse. Psychotherapies include

behavior therapy, play therapy, social skills training, family therapy, group therapy and cognitive behavior therapy.[39]

The developmental level and cognitive/emotional abilities guide the mode of therapy. For preschoolers play therapy and parent management training are effective. Cognitive behavior therapy works in older children (more than 10 years of age).

8. Conclusions

Childhood depression is an entity that is recurrent, familial, has high rates of co-morbidity and has poor psychosocial outcomes. Symptomatology of childhood depression needs to be understood keeping in view the developmental perspective, which makes it difficult to diagnose at times or to get overlooked that can lead to increased morbidity. Interventional strategies include pharmacological and non-pharmacological management after assessing suitability. Treatment should focus on remission because presence of depressive symptoms has negative effects of functionality, global functions and can be a risk factor for relapse of depression.

Conflicts of interest

None.

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