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Raised C-reactive protein in medication overdose: A report of two cases

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Abstract

Studies have been coming out focusing on the biological markers of suicide. Here, we present two cases with raised C-reactive protein who were admitted after attempts of suicide by overdose. There is a need to study the neuro-immuno-endocrinal changes in suicide systematically that will give insight into the biological underpinning.

Keywords

Poisoning, overdose, raised C-reactive protein, suicide in Bangladesh, biomarkers

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Introduction

Suicidal behavior is a leading cause of death across the globe as someone dies every 40 s and suicidal attempts are reportedly 20 times higher than suicides.[1] However, researchers and academicians are still struggling to identify any precise risk factor and to notice correctly an individual who is suicidal as it is the end result of the complex interaction of diverse factors.[2] A previous suicidal attempt has been considered the best predictor of further attempts as well as death by suicide in the future.[2] Recent studies have been coming out focusing on the neurobiological aspects, immunological changes, and biological markers of suicide.[3,4] Therefore, finding out a biomarker that can estimate the risk precisely could be an important target to prevent suicides.[5]

Among the few inflammatory markers like tumor necrosis factor-alpha, raised interleukin (IL)-6, and reduced IL-2, C-reactive protein (CRP) has shown a promising role even though, further robust studies are warranted.[3,4] We present here reports of two cases with raised CRP who were admitted after non-fatal attempts by overdose.

Cases

Case 1

Mrs. T, a 20-year-old woman was transferred from the emergency department after the initial assessment to the department of psychiatry for subsequent management in February 2020. She took 19 tablets of olanzapine 5 mg 3 h back after a quarrel with her husband. She studied up to grade 8 and married for 3 years. Currently, she is a housewife having one daughter and lives in a joint family with her husband and in-laws. Her husband is a chronic user of multiple addictive substances that heralded them to a bad conjugal relationship. During this suicide attempt, her intent was to die due to intolerable pain in daily life. However, no psychiatric diagnosis was established from her current mental status examination (MSE). Physical examination and electrocardiogram (ECG) revealed sinus tachycardia (130 beats/min) in a regular rhythm. All other investigations, that is, complete blood count, liver function test, renal function test, and routine urine analysis were found within normal range except raised CRP (15.7 mg/L (reference range = < 6 mg/L)). She was managed conservatively and was discharged on request after 2 days.

Case 2

Mrs. S, a 24-year-old married housewife was referred to psychiatry from the emergency department for inpatient admission and further management in March 2020. She took five tablets of amitriptyline (25 mg) 2 h ago with the intent to die

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Table 1. Profile of the cases.

Variable	Case 1	Case 2
Age in year	20	24
Sex	Female	Female
Education	Grade 8	Grade 12
Occupation	Housewife	Housewife
Marital status	Married	Married
Overdose drug	Olanzapine (5 mg × 19)	Amitriptyline (25 mg × 5)
Risk factor	Marital discord	Marital discord
CRP (mg/L)	15.7	22.6

CRP: C-reactive protein.

after a quarrel with her husband while she was threatened to divorce. During admission, her vitals were normal. Her psychiatric evaluation revealed no psychiatric diagnosis. She thought that life will have no meaning if she would be forced to take a divorce. She studied up to grade 12, married for the last 8 years, and had one son and one daughter. All investigations, that is, complete blood count, liver function test, renal function test, routine urine analysis, and ECG were found within normal range except raised CRP (22.6 mg/L (reference range = <6 mg/L)). She was managed conservatively discharged on request on the following day (Table 1).

The cases are being reported by complying with the Declaration of Helsinki 1964. They are being reported anonymously and informed consent was taken to publish their anonymous information. No formal institutional review board permission was taken for this report. CRP was measured by an automated biochemistry analyzer, cobas c 311 (Roche-Hitachi, Japan).

Discussion

Identification of potentially useful biomarkers of suicide is one of the current focuses of suicide research. Here, we report two females with raised CRP after having an overdose of medications. The age of the suicide attempters was 20 and 24 years. In both of the cases, the CRP was raised, that is, 15.7 and 22.6 mg/L respective without any other sign of infection/and inflammation. Both cases have a history of early marriage, early age of having a first child, and they have to do activities outside the home. One case (Case 1) has enduring stressful life as her husband is a chronic poly-substance abuser. However, none of the cases had a history of physical and/or psychiatric co-morbidity or any medical cause that could explain the raised CRP.

Inflammation has been identified as a potential trigger for several psychiatric conditions specially depression and suicidal behavior.[6] Studies have been reported that persons with suicidal behavior have evidence of having inflammation.[7] Some studies[3–7] have identified the potential inflammatory markers and revealed an association with the levels of the markers while some other studies[8,9] revealed findings refuting such a relationship. Therefore, replicative studies across time and culture are warranted. Another study assessed the role of common infections on suicidality and revealed that common infections have no influential role on suicide and suicidal behavior.[10] However, the role of inflammation and increased level of CRP has been noted in an other study.[11] It has been postulated that chronic inflammatory response could have roles in influencing the suicidal behavior.[11] Other studies[3,4] reported an increased level of CRP in non-fatal suicidal attempts and CRP has been recommended as a potential trait marker of suicidal attempt.

In both cases, there was no information regarding the level of inflammatory marker CRP, before the suicidal attempt. The CRP levels were estimated after the hospitalization following suicidal attempts. Here, we speculate few possibilities such as elevated level of CRP prior to the suicidal attempt, which continued to persist, elevation of CRP following ingestion medications in overdose, the possibility of any inflammatory process in the hospital setting, the result of psychological disorder, and results of ongoing stress leading to activation of the hypothalamo-pituitary-adrenal axis. However, raised CRP due to the inflammatory process in the hospital was not justifiable as there was no clinical evidence of systemic inflammation and the hospital stay was short (2–3 days). In addition, raised CRP due to psychiatric disorders was also not explainable as the patients did not qualify for any psychiatric disorder on serial MSEs.

We hypothesize that individuals, who attempt or die by suicide, go through enormous psychological distress, which might be responsible for activation of the hypothalamo-pituitary-adrenal axis and alteration in the level of inflammatory parameters.[3,4] However, several aspects should be considered as the measurement was done for a single time, follow-up investigations could reveal different scenarios and any change over time could not be assessed, and only two cases were assessed. We did not assess the body mass index of the patients. In addition, we did not assess the suicidal intent with any objective instrument due to the unavailability of culturally validated instruments. We acknowledge that it is difficult to identify any specific cause and effect relationship from this report as suicide itself is a

complex phenomenon. However, this is the first report from Bangladesh which could raise the issue and it is expected that further well-designed studies will be initiated to investigate the immunological changes in persons with suicidal behavior. Furthermore, clinicians treating patients with suicidal behavior would consider the complex phenomenon of immunological changes without any explicit signs of inflammation in Bangladesh.

Conclusion

There is a need to study the neuro-immuno-endocrinal changes in the suicide attempters systematically that could give insight into the biological underpinning of suicidal behavior. Pieces of evidence have been coming out day by day assessing the predictive role of CRP in suicidal behavior. This report could help to support the increased CRP that may be associated with suicidal behavior. However, the relationship is yet to be established by further well-designed robust studies.

Declaration of conflicting interests

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Ethical approval

Our institution does not require ethical approval for reporting individual cases or case series.

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Informed consent

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