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Hit that Changed the Behaviour: A Case of Moderate TBI

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A family-hit [TBI] that refreshed the Phineas Gage incident has been presented in this study. The event's significance attracted the attention of the researcher to explore the case in depth. The family-hit on the top right forehead just above the eyebrow was hard enough to knock down the 8-year-old child on the ground. It was a primary injury that took almost three weeks to heal. The physical injury seemedminor, but associated psychological trauma led to behavioural and personality upheaval in the child. The consequences associated with secondary injury had observable effects on the victim's behavioural expressions. For collection of historical accounts, a self-designed semi-structured questionnaire was used to interview the participant, parents, and teachers. The present case describes the causes and circumstances of the event and post-event analysis. The subject's intelligence was assessed using Coloured Progressive Matrices and the Seguin Form Board. The results indicated average intellectual capacity.

Keywords: TBI, psychological trauma, behavioural expression

Phineas P. Gage's case was a watershed event that transcended the scope of psychology beyond the mind, behaviourism and other schools. It was a clear case of traumatic brain injury (TBI). The Cavendish, Vermont (1848) incident changed our view about the relationship between mind and brain (O'Driscoll & Leach, 1998). The white and grey matter-smeared tampering rod that left Gage blind in the left eye also produced significant behavioural and personality changes. The incident is unique in psychology and has become a reference point for over five decades. "The injury to the prefrontal cortex of the frontal lobesof the brain can cause profound personality changes, without other apparent neurological deficits (Observations byDavid Ferrier in 1878). The event opened the floodgates of the brain for psychologists desirous of knowing the role of the brain in human behaviour with direct evidence.

In the present case, the rugged and rustic glass brimming with local wine replaced the tampering iron; though it did notpierce the head, it was significant enough to disturb the interior of the frontal lobe. The child suffered moderate traumatic brain injury, which can result from a simple blow to the head (Georges&Das, 2023). The eight-year-old male child, third in birth order from a low-income family, was struck above the tail end of the left eyebrow by none other than his father. It was a summer evening. The bleeding child screamed to the capacity of his lungs with excruciating pain. The intensity of the hit was so strong that the child's small body couldn't resist the projectile force and consequently crashed to the ground. The child was lucky enough to survive. According to the Indian Head Injury Foundation website, in India, only 1 out of 6 brain injury trauma victims did not survive, while in the US, this figure is 1 out of 200. In India, nearly 20 lakh

people sustain brain injuries, and almost 2 lakhs succumb to their injuries (Gururaj et al. 2005). The wound took nearly three weeks to heal, leaving a small vertical crescent scar at the top right forehead just above the eyebrow (Figure 1). The physical injury seemedminor, but associated psychological trauma led to behavioural and personality upheaval in the child. It was a case of primary head injury resulting from primary external impact (Galgano et al., 2015). The injury led to observable behavioural changes.

Figure 1. Vertical crescent scar at the top right forehead just above the eyebrow

Observed Behavioural Manifestation

- Significant agitation crisis symptoms (Luaute, et al., 2016).
- Intelligence (raw score 24)
- Physically hyper-active [overflowing energy] with significant attention deficiency
- Poor academic memory with a significant lack of interest in academics (Figure 2)
- Significantly sluggish in learning
- Non-cooperative on social issues such as poor peer relations
- Unanimous rejection by classmates
- Careless in self grooming
- Typical gaze of mistrust
- Poor eyesight (Nearsightedness/ Myopia)
- Poorly built physical structure

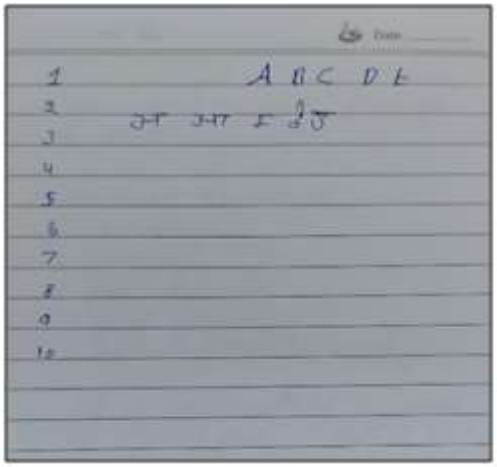

Figure 2. Sample of Observable Academic Output

Method

Sample

Single case study (13-year-old male child, age at the time of study), child's mother (Father refused to participate), classteacher, school psychologist and the intern student who were instrumental in the identification and closely associated with this case.

Data Collection

The self-designed semi-structured questionnaire was used to interviewthe child, parents, and teachers. All stakeholders were adequately briefed on the purpose of the study, and consequently, written consent was obtained. The questionnaire contained questions aboutevents, pre- and post-incident behaviour, school behaviour, academic performance and intervention. Questionnaires for each category of participants were separate (Appendix I, II, III). However, specific questions were kept standard. Apart from that, open-ended questions were asked to gain deeper insights into the outcomes of the traumatic incident. Informal discussions were also held with the student's classmates and other school students familiar with him. The student was

administered acoloured progressive matrices test (CPM), which is an alternative form of Raven's progressive matrices (RPM)published in 1940 (Leavitt, 2011) and the Seguin Form Board Test was used to assess intelligence levels and compare the results.

Procedure

At the outset, the researcher approached the child through her class teacher. A rapport was established at the preliminary stage, amonumental task. The apparent stigma of self-perceived shame loomed large on the face of the child. The child was reluctant to talk or share basic information with the researcher. The long-associated class teacher was called upon for help. The teacher could convince the child to initiatea talk with the researcher. It took two completed sessions of one hour each to establish workable rapport. Following workable rapport, the child was interviewed and administered witha semi-structured questionnaire. The following individuals were separately interviewed to gather information about the subject.

- Child's classmates-cum-playmates (three boys).
- Child's class teacher
- Child's mother
- Child's brother
- School Psychology teacher-cum-psychologist

Results

Intelligence

The subject's IQ level was 70 (CPM), where he lies between the 25th and the 75th percentiles, encompassing the intellectually average category. For the Seguin Form Board Test (SFBT), the shortest time was 16.3 seconds, and the total time was 52.4 seconds. According to norms (Goel& Sen, 1984; Bharat, 1971), the subject's mental age is likely to be 12 years.

Subject's responses

The subject has a clear memory of the incident and knows who hit him and with which object he was hit. However, he did not understand why he was hit (response to the second question). When the child was asked who he loves to associate with (shares his personal information), he replied none. He has no recollection of being taken to the nearest primary health centre for treatment. In a clear case of attribution, he feels safe to blame his father and circumstances for the incident. He is reluctant to go to school. On further enquiry, he said he goes to school due to his father's fear, a midday meal and the freedom to play. He did not know the reason why he was hit, but his brother, who witnessed the scene, shared the blame for the incident equally among alcohol, father and subject. The subject stated that his father is cruel, non-cooperative and permanently remains under the influence of alcohol. He hates him. While he praised his mother for working hard and bearing the family burden, she sometimes gave her peace of mind.

Parent's (Mother's responses)

The subject's mother confessed that she was at home during the incident. In a joint response to the second and third questions, she said that creating a stir and resorting to violence is a regular phenomenon. We are afraid of evening. When probed further, she said that his bad habit (referring to the alcohol addiction of his husband) had deteriorated the family environment. When the researcher asked about help from the government or non-government organisations, she responded with a blunt no, with apparent disgrace on her premature, wrinkled face. Regarding emotional expression by her son (subject), she said that before the incident, he was an obedient child

with childish behaviour, calm and gentle, used to sleep for longer hours, had average food intake, engaged in troublemaking with lesser frequency and intensity, almost had no complaints, easily mingle with friends and more importantly he uses to share things among older and younger siblings. However, post-incident, everything has gone upside down.He is no more what he was. Immediately after the incident, he had several bouts of high fever. He does not listen, neighbours and peers regularly complain against him, is not interested in studies, sleeps less, regularly demands money, and is found to be engaged in stealing small objects. I have thrashed him several times but in vain. What should I tell? His father does not listen if I complain; he knows only one thing, i.e. to pick up a stick and thrash whoever comes before him. The incident has changed my son's behaviour and worldly perspective. She asked the researcher with typical innocence on her face, "Can you do something?" were her last words before theabrupt termination of the interview.

Teacher's responses

No, this was the class teacher's answer to the first question (Appendix III). Discharging administrative responsibilities leaves me with less time to manage the classroom effectively. Additionally, I strive to provide individual attention to the needs of each student. Daily, students come to me to complain about the subject's rude behaviour. He seems to be omnipresent as far as negative affairs are concerned. He is the slowest learner and has very little academic knowledge. He cannot sit quietly even for a few seconds and does not pay attention. His eyes are always on go stance. No one likes to be his desk-mate, playmate, or friend. He seems to have anti-social dominant thoughts. No, he does not complete his homework. I have drained all my pedagogical resources. I have tried all strategies: audio-video aids, learning by doing, variable ratio schedule, negative reinforcement, punishment, play therapy, friends' therapy and buddy teaching. Parents never bothered to cooperate with me; they (the only mother) visited the school for parent-teaching meetings twice in the last three years. Despite several regular telephonic or note reminders, they do not turn up. He expresses his negative emotions with more intensity and frequency. I rarely find him smiling or laughing. He regularly attends school but does not like to attend classes; instead, he loves to bunk classes and roam around. He showed little interest in other activities except where he was given leadership roles. He prefers an autocratic leadership style. Once, I made him a class monitor (giving responsibility) and asked him to write down the names of students on the board who make noise. Rather than writing the names on the board, he took the law into his hands and slapped several students. There was a stir in the class. Later, I learned that a group of students outside the school hours badly thrashed him. Other teachers had more or less similar views about the participants. In response to question No. 9 (Appendix III), the teacher admitted that she once met one of the participant's primary teachers during the department's one-day program and enquired about the participant's behaviour out of curiosity. Regarding general behaviour, the teacher responded with a gloomy outlook and said I do not think this school or we teachers are trained to handle children like him. He must be admitted to some other institution to receive appropriate intervention. If it remains unnoticed, he may find himself trapped in the pool of crime and drugs because he is on the threshold of adolescence.

Discussion

The CPM-assessed IQ level indicates that the subject falls in the intellectual average category. The SFBT results indicate that the mental age is lesser by one year than the chronological age. However, the lower

intellectual categoryand mental age cannot besolely attributed to the specific incident. The meta-analysis found that moderate TBI can cause persistent intelligence impairment (Konigs et el., 2015). The present study subject's response patternindicates average memory and a satisfactory understanding of the events. The discussed injury may or may not have influenced his cognitive functionalities, but it had left an indelible mark on his cognitive landscape, resulting in a behaviour change. The severe injuries have not been found to causelong-termmajor intellectual impairments (Wood & Rutterford, 2006). The subsequent behavioural manifestations could result from the secondary injuryinitiated internally after the primary injury, which has been attested in the findings (Marshall, 2000).The subject's motherasserts that the child underwent several bouts of high body temperature post-incident. Post-TBI, there occurs an increase in body temperature, which correlates with increased cytokine release. The mother's pre and post-incident behavioural observations of her son are indicative of significant changes in the cognitive domain. The changed behavioural outcomes seem to emerge from the secondary damage. Secondary brain damage contributes to the development of clinical symptoms. As evident from class teacher responses, the subject is a clear case of misfit and has a high chance of suffering from ADHD.The injury has caused a significant behaviour change, which has had a significant negative impact not only on the self or family but also on teachers and fellow students.

Limitations

As the reported case is an ex-post facto study investigated five years after the incident, other factors may have influenced the behavior modification during that time. Because the study was conducted post-event, no standard behavior checklist was used. Consequently, the observable behavior changes are entirely based on the narratives provided by various stakeholders.

Conclusion

An eight-year-old child sustained a traumatic head injury; the intensity and subsequent outcomes warranted it to be classified as moderate. The first-hand responses of all stakeholders painted a behavioural picture, which showed the secondary impact of TBI. The behaviour has undergone significant change in a negative direction post-TBI. The intelligence test results showed that the individual falls under the intellectual average category.

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