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**BRAIN SIGNATURE PROFILING IN INDIA: IT'S STATUS AS AN AID IN
INVESTIGATION AND AS CORROBORATIVE EVIDENCE - AS SEEN FROM
JUDGMENTS**

Puranik, D.A.* , Jospeh, S.K.* , Daundkar,B.B. , Garad,M.V.*****

Directorate of Forensic Science Laboratories, Mumbai, Maharashtra

Abstract: *In the recent years, there has been gradual increase in the crime rate of our country. With the increasing number of crimes, physical evidence left on the crime is nil or negligible and thus it becomes relatively difficult for the investigating agencies to gather evidences which will lead them to the perpetrator of the particular crime. Further, although the investigating agency may reach a particular suspect in a crime, it has to be proved in the court of law by the prosecution that the suspect is involved in the crime. For this purpose, the legal system has placed emphasis on oral or documentary evidences, to convict an individual of a particular crime. Recently, there is lot of dependency on newer scientific techniques which are used as an aid to an investigation process. One such technique is Brain Electrical Oscillation Signature Profiling, which has received lot of public attention. Brain Electrical Oscillation Signature Profiling (BEOS) is a scientific tool, which is used to identify individuals with Experience of participating in a crime. However, BEOS has come under scanner at various times and its credibility has been questioned, when, there have been media reports which claimed that some subjects have been convicted on the basis of this test. The question that then arose was is it true that the subjects have really been convicted on the basis of the results of this test and if that was true then what were the basis for the same? Further, it is interesting to understand in what way the test results have in reality been considered by the honorable courts. In an attempt to understand the evidentiary value of BEOS, this paper discusses the results of this tests in numerous cases as considered by the Indian courts.*

Key Words: Brain Electrical Oscillation Signature Profiling (BEOS), Evidentiary Value, Corroborative Evidence.

INTRODUCTION:

LEGAL SYSTEM IN INDIA

According to the Indian Evidence Act of 1872, Evidence means and includes all statements which the Court permits or requires to be made before it by witnesses, in relation to matters of fact under inquiry; such statements are called 'Oral' evidence as well as all documents produced for the inspection of the Court; such documents are called 'Documentary' evidence. Evidence may be given of facts in issue and relevant facts. Evidence may be given in any suit or proceeding of the existence of the nonexistence of every fact in issue and of such other facts as are hereinafter declared to be relevant, and of no others. Law of Evidence governs the use of testimony (e.g. oral or written statements) and exhibits (e.g. physical objects) or other documentary material which is admissible (i.e. allowed to be considered by the trier of fact, such as jury) in a judicial or

* Scientific Officers, Forensic Psychology Department, DFSL, Mumbai

** Deputy Director, Forensic Psychology Department, DFSL, Mumbai

***Director, Directorate of Forensic Science Laboratory, Mumbai

administrative proceeding. The theory of proof beyond reasonable doubt before convicting a person accused of a crime takes within its sweep the reliable direct and circumstantial evidence which would conclusively establish the facts relevant to the criminal act.

In India, the role played by the government forensic scientist has been given the recognition in Section 293 of the Code of Criminal Procedure (1973) of the legal system. According to this section, any document purporting to be a report under the band of a Government scientific expert to whom this section applies, upon any matter or thing duly submitted to him for examination or analysis and report in the course of any proceeding under this Code, may be used as evidence in any inquiry, trial or other proceeding under this Code. If the court may, if it thinks fit, summon and examine any such expert as to the subject matter of his report.

An opinion of an Expert Witness is accepted under Section 45 of the Indian Evidence Act. This section deals with the opinions of the expert as explained, It states: 'When the court has to form an opinion upon a point of foreign law, or science or art, or as to identity of handwriting (or finger impressions), the opinions upon that point of persons specially skilled in such foreign law, science or art, (or in questions as to the identity of handwriting or finger impressions) are relevant facts. However, an expert witness is not a witness of fact. His evidence is really of an advisory character. The duty of an expert witness is to furnish the judge with the necessary scientific criteria for testing the accuracy of the conclusions so as to enable the judge to form his independent judgment by the application of such criteria to the facts proved by the evidence of the case. The scientific opinion-evidence, if intelligible, convincing and tested, becomes an important factor for consideration along with the other evidence of the case. The credibility of an expert witness depends on the strength of the reasons stated in support of his conclusions and the data and material furnished, which form the basis of his conclusions, (See, State of H.P. v. Jai Lal (1999)7SCC 280).

BRAIN ELECTRICAL OSCILLATION SIGNATURE PROFILING (BEOS)

Brain Electrical Oscillation Signature profiling is a technique developed by Dr. C.R. Mukundan in the year 2003 after lot of research. This technique is currently been used in a Forensic set-up to identify the presence of Experiential Knowledge in the perpetrator of the crime. Knowing and Remembering are two Neurocognitive processes, of which Knowing refers to the cognitive process of recognition with or without familiarity, whereas Remembrance is the recall of episodic and autobiographical details from a person's life.(Mukundan, 2008). Differentiation of neurocognitive processes of recognition and remembrance have been established by numerous studies (Tulving,1987; Gardiner and Java, 1990; Tulving et al., 1994;LePage et al., 1998; Henson et al.,1999; Smith, Jonides 1999a,b; Aggleton, brown 1999; Gilboa 2004; Umeda et al., 2005). Recognition or Knowledge is a conceptual representation, acquired through various means of communication and conceptualization (Mukundan, 2007). While Remembrance is the neurocognitive process of bringing personal past to the present and thus involves Personal Experience of an individual which was gained by personal participation. The program of Brain Electrical Oscillation Signature Profiling does not measure Knowledge but it measures remembrance of the Experiential Knowledge or autobiographical information, which consists of awareness of internal processing or remembrance, sensory-motor mental imageries associated with experience. The electrical activity related to remembrance is called the "Signature" of the experience. The process is defined as the retrieval of the Experiential Knowledge. The signature will be present only if a remembrance can be evoked by the specially designed probes. Absence of Experiential Knowledge results in the absence of the signature. Experiential knowledge is facilitated by awareness of contextual details and emotional arousal if present. (Mukundan, 2007)

EVIDENTIARY VALUE OF BRAIN ELECTRICAL OSCILLATION SIGNATURE PROFILING

Brain Electrical Oscillation Signature Profiling (BEOS) is a technique which had been developed in the year 2003. The technology of BEOS is being currently used in the Forensic Laboratories of Mumbai, Gandhinagar and Chandigarh and further many more laboratories are planning to start this test. Currently, approximately 300 subjects have undergone the BEOS test for the cases in which they have been suspected to be involved and in some of these cases, the Experts have been summoned under Section 45 of Indian Evidence Act. Some of the judgments in which this particular technique was considered in some way or the other have been obtained through proper channels and further they have been analyzed qualitatively.

Case of a Young Salesman

A Young salesman was suspected to have murdered his co-worker in an attempt to grab the keys of locker of their shop so as to steal. The investigation had revealed that deceased and accused were staying together in the same shop where they were working and deceased been an old employee of the shop had the keys to the locker of the shop. On the night the incident took place, subject and the deceased were together in the shop. Further, after this murder, the subject had disappeared. He was arrested after few days and was then was referred to Psychology Department for BEOS along with other tests. The results of the tests were found to be indicative of the subjects involvement in this murder and the report of same was submitted, for which the expert was summoned in the court. The Expert deposed in the court along with other eyewitness. In this case, while considering the report of BEOS, the court observed that ‘the witness appears to have applied the Brain Mapping (BEOS) test effectively on accused by observing detail procedure and the report is in positive. This is a circumstantial evidence which goes against the accused along with other evidences.’

Case of Arsenic Poisoning

In this case, a young MBA student was suspected to have murdered her Ex Boyfriend by mixing Arsenic in the ‘Prasad’ which she had offered him. During investigation, it was found that both the deceased and the accused were into a relationship, however, had broken off months before the death of the deceased. Accused further had married another guy (second accused in the case) secretly and left the city. However, 2 days before the death of deceased, she came back to city and stayed in a lodge in false name. Further, she met the deceased and offered him some ‘Prasad’ after which deceased was hospitalized and declared dead after 2 days. Further investigation revealed that the death was due to Arsenic Poisoning. The subject was referred was BEOS test along with other tests in the Psychology Department. The report of BEOS test was in ‘Positive’, which was also corroborated by Polygraph Test. During the trial, the Expert was summoned along with 32 other witnesses.

In this case, the court while considering the report of BEOS observed, ‘One such link in the circumstantial evidence is the evidence of Brain Electrical oscillation Signature profiling along with Polygraph. As regards to that admissibility of this evidence, learned APP has relied on the authority of Ramchandra Ram Reddy VS State of Maharashtra ALL M.R.Cri L J 2004 Bom.1704, where it is held that, “as these tests are not in the nature of Testimonial compulsion, they do not in any way violate Article 20(3) of Constitution and recourse to such test can be taken if and when investigating agency seeks to introduce such statement as evidence.” Thus the use of these tests both during the course of investigation and trial is held to be admissible. Learned APP has also relied upon the observations of Apex Court in the case of State VS. S.J. Choudhary, 1996 DGLS 346 wherein the evidence relating to expert was considered and it was observed that: “ It is obvious that the Indian Evidence Act when enacted originally in 1872 did not specifically mention typewriting in addition to handwriting because typewriters were then practically unknown. However, the expression ‘science or art’ in Section 45 in addition to the expressions ‘foreign law’ and handwriting’ used in

the section as originally enacted and the expression ‘finger impression ‘ inserted in 1899, is sufficient to indicate that the expression science, or art cannot, therein is of wide import. This meaning in Section 45 and each of the words ‘science and art ‘ has to be construed widely to include within its ambit the opinion of an expert in each branch of these subjects, whenever the court has to form an opinion upon a point relating to any aspect of science or art”. It was further observed in this authority that – “ An enactment of former days is thus to be read today, in the light of dynamic processing received over the years, with such modification of the current meaning of its language as will now give effect to the original legislative intention.” It was concluded by holding that- “That cannot be any doubt that Indian Evidence Act 1872 is, by its very nature, an ongoing Act”. Thus in view of section 45 of the Evidence Act, whenever the court is required to form an opinion upon a point of science, then the court can take the help of the opinion of the person specially skilled in the said science and the opinion of said expert is admissible in evidence as relevant fact by virtue of Section 45 of the Act. In the instant case, as the witness summoned is an expert in the branch of Forensic Science pertaining to Psychological Evaluation Test, his Opinion being of an expert, is admissible in evidence by virtue of section 45 of the Act and his opinion supports prosecution case so far as accused involvement and authorship of the crime is concerned. Of course this court is aware that the results of these Tests are not to be treated as conclusive in the sense that on the basis of those results only the case is not to be decided. They are just one of the links in the chain of circumstantial evidence, like any other evidence on which prosecution places reliance.’

Case of a Murder of an Employee

This is a case where the deceased was working as a driver and a labor worker on daily wages for the accused. However, the said wages were not paid regularly to the deceased and thereby there was huge outstanding amount of salary from accused to deceased. On the day of this incident, the accused had come down to deceased’s residence and asked him to accompany him for some work. At the same time, the deceased had requested the accused to assist him financially. Further both of them left after which deceased was found to be murdered in a nearby village. Accused, in this case was referred for BEOS Test along with other tests. The results of the test were ‘Positive’ and were supported by other evidences. Here the expert summoned was one of the 26 witnesses being summoned. In this case, the report of BEOS was accepted and the court observed, ‘that the test of Brain Finger Printing (Brain Electrical Oscillation Signature Profiling), though it is not concluded proof but having gone through the said reports of accused read with other evidence in this case, it can safely be inferred that the said reports can be accepted as corroborative piece of evidence in support of other evidence of prosecution witnesses and documentary evidence adduced by the prosecution. Since the tests are scientific tests, are conducted in scientific manners and with latest scientific machines and therefore, these examinations and its results cannot be discarded in this case as it corroborates with other evidence brought on record by the prosecution including oral as well as documentary and therefore, the results of the said examinations are acceptable in this case.’

Case of 5 Murders in a Family which included a Female and 4 Children

A servant was suspected to be involved in the murders of few members of his employer’s family which included one woman, 3 children and a servant. The investigation revealed that the deceased were first murdered and then the house was set on fire in order to destroy the evidence. Further, this subject was found to be hanging by holding a hook and was unconscious. Furthermore, the subject had confessed about the crime to some of the witness. In this case, subject was referred for BEOS test along with other Psychological tests. The results of the test were ‘Positive’ and the expert was one of the 20 witness were examined on behalf of Prosecution. The results of BEOS were also supported by the confession of the subject to the expert. Further, the court observed that there is strong circumstantial evidence which also has corroboration of

scientific tests and there is also confessional statement of accused before police, other witnesses and scientific officers. Hence the report of Brain Electrical Oscillation Signature Profiling was accepted as corroborative evidence along with other evidences.

Case of Murder of an Entire Family

In this case, an entire family had been murdered; however, each member of the family was murdered on different dates and at different places. The investigation revealed that the deceased and his family had some loss in their business when they had met the accused. The accused lured the family by stating them that if they give him some money, he will buy them gold in lesser price. Accordingly, the deceased seem to have given some money to the accused and further accused had taken the deceased to some place, after which he was murdered. Further, other members of the family were murdered and there was an attempt of destroying physical evidences. Further, the subject was referred for BEOS test and the results of which were 'Positive'. The Expert who had conducted the test was summoned along with approximately 37 witnesses. Further, the court while considering the results of the test observed that although on the basis of the results of the tests, a person cannot be convicted, still the reports can certainly be considered as corroborative evidence, as they are supported by other evidences.

Case of Serial Murders of Street Dwellers

An interesting case of serial murders was referred along with a suspect for Psychological Evaluation. The referral included 7 murders which had taken place over a period of 5-6 months in Mumbai City. The subject was taken up for interrogation after the 7th case, in which the description given by one of the witness matched with the subject. This subject was tried differently for each of the 7 murders. In this particular case, a murder of an unidentified person, who used to sleep on the footpath, had taken place. The deceased was murdered by throwing a heavy stone on his face. In this case, the report of Brain Electrical Oscillation Signature Profiling of this subject was found to be 'Negative'. Here the expert was summoned and further it was stated that "the very purpose of taking the test is to find out involvement of the subject in the crime and for the purpose of investigation, so that the said person may be prosecuted for the offence alleged to have been committed by him by establishing the link between the act committed and him. As the prosecution could not insist about the report of the Brain Mapping test etc., I am of the opinion that, the purpose might have not been served by taking this test".

However, in another case of the same series, wherein the result of the BEOS test was 'Positive', and in which the Expert deposed. The court in this particular case has observed that the reports of the Experts are not rather substantive evidence. But it can be taken into consideration as corroborative evidence to the evidence given by the other witnesses.

Case of Serial Murders of women and children in an Indian Village

This is a sensitive case of serial murders of woman and children of a village in India. The two subjects suspected were a businessman and his servant. The two were arrested, after an EMI of a mobile phone of one of a deceased was traced to their residence. Further, on investigation, the bones, skulls and clothes of many of the deceased children were recovered from the backyard and canal behind their residence. The subjects after their arrest were referred for BEOS and other Psychological test. The result of BEOS was 'Positive' for one of the subject and was corroborated by the subject's confession after the test. The Expert summoned was one of the many witnesses in this case. During the trial, the court accepted the results of the BEOS test along with other test when relevant. Further, the other subject's BEOS report was 'Negative',

however the subject was convicted along with the first subject. In this case, both the subjects had appealed in higher court. Recently the subject whose report was 'Negative' was acquitted by the upper court.

Case of an Attack in Revenge

In one case, the deceased was attacked on a night when he was drunk and had fights with some of the villagers. He was attacked with the back of an axe and his body was lying near the statue of Indira Gandhi in the village. In this case, the subject himself had gone to Police Station and confessed to have attacked the deceased in anger for being abused by deceased. However, the subject was not aware when he reached the police station that the deceased was dead. During the trial, the subject denied the charges against him. In this case although the expert deposed that the test results concluded that there was involvement of the accused in the crime, the court stated that the evidence of this expert cannot be considered as solitary evidence to base conviction since the other evidences and the circumstances on record brought by the prosecution is not sufficient to prove the guilt of the accused beyond reasonable doubt.

Case of Murder in a Family Fight

In a case, the deceased was son of one of the accused and brother of another accused. On the night this incident has taken place, the deceased after his dinner was sleeping along with his father and his brother (who are accused in this case.). Next day morning Father tried waking the deceased; however, he did not wake up and further was taken to hospital where he was declared dead. The PM report stated that the cause of death as, "Death due to throttling with multiple internal chest and abdomen injuries with internal hemorrhages due to assault with hard and blunt objects." During the Investigation, it was revealed that the deceased had physical fight with both the accused and was beaten up by them for being drunk and harassing them in middle of the night, after which they went back to sleep. During the trial of this case, the Expert who had conducted the test was one of the many witnesses being summoned, as the results of the test were Positive. The honorable court observed that the test of Brain Electrical Oscillation Signature Profiling, are by itself not a sufficient circumstance to connect the accused persons with the death of deceased. Since the prosecution has not tendered any clinching evidence against the accused persons. The only circumstance relied upon by the prosecution to connect the accused persons with the crime are not established through material witnesses. Hence both the accused were acquitted of the offence punishable u/s.302 r/w 34 of the Indian Penal Code. '

Case of Murder of a School Teacher

In this Case, on a particular morning, a school teacher was murdered at the site of construction, by means of throttling as well as hitting her by means of stone and taking away her ornaments and throwing the septic tank in order to conceal the evidence of murder. During investigation, investigating agency received a call stating that the body of this school teacher is in a septic tank of a particular construction site. After the recovery of the dead body, the workers on the construction site were arrested and some of them confessed to this crime. With regards to this case, 8 subjects were referred for Psychological Evaluation and amongst it, 4 subjects had undergone BEOS test and the results of them were 'Positive.' The results of the tests were used only as an aid to investigation. Further, during the trial, reports of the tests were not submitted in the court. However, the 4 subjects were convicted as there have been strong circumstantial and direct evidences against them. The other 4 subjects in the case were acquitted. Although, the test results of BEOS were not submitted in the court, it had been useful for the investigating agency.

In some of the other cases, the Expert has not been summoned by the courts, but the report has been accepted.

DISCUSSION:

Brain Electrical Oscillation Signature Profiling (BEOS), being considerably a new technique, is gaining wider use in the investigation process. Being used on approximately 300 subjects suspected to be involved in criminal activities, and the increase in demand for the conduction of this test, is an indication of the usefulness of this particular test in a Forensic Set-up as an aid to investigation. On the basis of the judgments which have been available, no court has till now objected to the use of this test for the purpose of the investigation. Further, Section 45 of the Indian Evidence Act is wide enough to accept results of an expert in any field of science or art, when the court has to take decision. Hence under this section, courts have been accepting the results of the BEOS test provided they are being corroborated by other substantive or even circumstantial evidences which together are enough to convict a perpetrator of the crime. Expert Evidence in a criminal trial is just a fraction of the totality of the evidence on the appreciation of which the judge or the jury takes the decision. So far, there has been not even a single case, in which the court has convicted a subject based only on the results of the BEOS test. In fact, in the cases, wherein results of the BEOS tests and other Psychological tests were Positive but were not supported by other oral or documentary evidences, the subjects in those cases have been acquitted of the charges against them. Further, although the BEOS test may be used for a particular case, it is not necessary that the reports may get submitted in court.

CONCLUSION:

Brain Electrical Oscillation Signature Profiling (BEOS) is certainly a useful test as an aid to investigation provided it has been conducted in a scientific manner.

The results of the BEOS test, if positive, and if supported by other direct or circumstantial evidences can be accepted as corroborative evidence under Section 45 of Indian Evidence Act.

If the result of the test are positive but are not corroborated with other direct or circumstantial evidences, then they are not substantive enough to convict an individual suspected of the charges of committing the crime.

If the tests of the results are negative, and if they are not supportive of prosecution, the courts may consider that, the purpose for which the test was taken has not been served.

If the test results are negative, but there is other evidence enough to prove the guilt of the perpetrator, the person would still get convicted.

Even if the test results are positive, they may not be submitted in court and hence may not even be accepted as evidence.

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