

GENERAL ARTICLE

HOW THE NEUROSCIENCE WORLD TOOK THE SUICIDAL DEATH OF PROFESSOR JONATHAN DRIVER (EXPERT IN COGNITIVE NEUROSCIENCE AT UCL) AND MICHAEL JACKSON (CELEBRITY, POP SINGER)?

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Prof. Jonathan Driver a converted neuroscientist¹ from POP Singing (Bassist in 80's pop band The London Boys) died last November. He underwent suicidal death. Earlier, the death of King of POP Michael Jackson² is intermingled between drug abuse, suicide and murder³.

INTRODUCTION

It is easy to relate the above two deaths of POP performers, and many of such un-noticed, to the family or socially related psychological stresses that cumulate to develop well known depression syndrome and finally suicide. However, apart from the beneficial effects of different types of music reported in literature⁴, it is also important to look on the gradual neuro-physiological changes that may occur in the body of a performer specially ROCK & POP, due to continuous strong exposure to high intensity lights, high pitched voice along with too rapid motor movements during performance. Transverse and longitudinal neuro-physiological studies (both macro and micro levels) are to be conducted on persons who are engaged in this profession and also to chronic listeners to prevent them to become patho-physiological cases by optimising their activities and environment and enjoy the beneficial music only, if desired.

Facts Based on Neuroscience:

The development of neuroscience in last five decades has lead to unveil the link between physical activities and human behaviour with physiological, pharmacological and neuro-chemical aspects of brain. However, many of these links need further investigations (at macro, micro and nano levels), in relation to the adoption of a particular behaviour or physical activity, specially POP singing as a routine that may bring patho-physiological changes in neural and body functions gradually and thereafter leading to multiple abnormalities, if adopted chronically.

The motor acts and sensations like the production of loud voice or listening of high frequency sound, vision in high intensity lights and rapid physical movement or activities are already linked individually to the neuro-physiological involvement of auditory/visual pathway, auditory/visual cortices, ascending/descending motor pathways, motor areas 4 and 6, basal ganglia, thalamus, mid brain structures, cerebellar circuits, vestibular apparatus, brain stem and finally the spinal motor neuron. In addition, the integration of all of the signals produced from above mentioned parts of brain in

various areas of the cerebral cortex responsible for specific motor actions and behaviour are also well understood. Even the neurochemistry is available in detail which is involved in all of the above mentioned motor and sensory aspects.

Pure scientific and related literature also provides ample evidence of pleasant and curing effects of soft music in many of the ailments and mood elevation.⁴⁻⁷ Even depression is also cured⁽⁷⁾ by using musical treatment to the patients. It is also reported that in addition to simply lowering the level of stress, music also raises immune markers in your system, creating more antibodies to fight disease.⁷

On the other hand high-frequency oscillations (HFO) of >100 Hz recorded in the animal brain have been considered for their functional roles in normal and disturbed⁸ neuronal electrical processes. Such studies on HFO are not carried out for human brain except up to the range of 80 Hz.

In addition, the fast ripples that produce in brain during epilepsy⁹ studied in rat models; represent an electrical surge resulting in a clinical problem. In this perspective such electrical surge may also produce in brain through some kind of strong and prolonged inputs like continuous or intermittent high intensity sound/light and fast body movements. Its example is the case of any POP singer who tries to match his voice and body movements with the fast music. Although, the study on fast ripples related it with epileptogenesis, but it can be suggested broadly that such electrical surge can also produce due to above mentioned reasons to develop 'hyper active' brain that gradually turns towards patho-physiological electrical status but not necessarily be the epilepsy.

Further, hyperkinetic disorders have been related with abnormal electrical activity in brain which is already proved through recordings of EEG and being treated with deep brain stimulation.¹⁰ It is also possible that if hyper body movements are routine then they themselves can lead towards abnormal electrical surge and electrical Pathophysiology with disturbance in neurotransmission in brain.

Hence, during the concerts on the one hand, the performer is exerting to have a loudest voice and hyper movements matching the POP music, in an environment having flooded high intensity lights. While, on the other hand, performer's brain, vital organ heart/lungs, vascular beds and muscles are reaching the patho-physiological limits every time he/she performs. If such performances are repeated continuously without reasonable recovery time to the above mentioned organs, then their bodies are not only facing immense demand of energy but also face the shortage of principle chemicals and neurotransmitters. The other danger is the accumulation and release of substances (initiating pathological changes) as a result of severe neuronal (synaptic) and muscular fatigue.

Core Issue:

Meeting the standards of Michael Jackson, Britney Spears or many others having preference to move fast and dance to match with the fast & loud music, it is quite possible that every performance bring the state of their vitals towards the limit of Pathophysiology that may recover if gap between two performances is wide. If such activity is maintained to gain the business, popularity and appreciation, it might initiate changes in the electrical status of neurons that may lead towards 'hyper active' brain which can be explained on the neuro-physiological basis of facilitation and potentiation and later on the basis of high electrical surge in the neuronal circuits. Hence, synaptic excitation & transmission might adopt a new level of firing. Further, with the time if such activities are maintained for years, it may lead to hyper electrical surge that may persists even at rest. Consequently, we have many examples of POP and ROCK singers who gradually developed multiple symptoms that include neurological or psychological ailments along with their physical disabilities.

It is to be noted that after the tragedy of Michael Jackson, the medical science, especially the forensic doctors concentrated only on highlighting his death as probable murder. And the killer was identified to be either the Dilantin (PHENYTOIN), or the Propofol (DIPRIVAN) or his own physician. No one is trying to concentrate on the actual culprit, i.e., the high intensity music, high intensity lights, highly pitched voice and hyperkinetic movements which were achieved routinely during performance.

It is important to note that though the brain of a person who is a performer might develop hyperactive brain due to patho-physiological changes in its neuro-physiology and neurochemistry. But nevertheless a person who attends and listen the concert is also affected to a lowest degree.

Although, the financially rich performers heavily pay to their promoters and consultants, like

laryngologists, psychologists, physiotherapists, pain managers and so many others. But, all of them concentrate on enhancing their performance since the performer's goal is also in this direction, and the counselling provided by the consultants towards the hazards that they may face in near or far future is ignored by the performer. In the initial stages the performer's abilities replenish/recover automatically as per body adaptabilities and systemic and cellular homeostasis. However, slowly and gradually the replenishment and recovery has to be supported by medicine starting with NSAID's and then reaching a stage to use anxiolytic preparation and antipsychotic ones. This is the stage that needs special attention of neuroscientists along with psychologists and other consultants to assess the related changes and deficiencies in brain, muscles and associated structures involved in visual/auditory inputs and motor performance.

According to the above mentioned facts, many performers suffer physical fatigue, myalgia, restlessness, insomnia, depression and even schizophrenia and many other problems as they progress in their profession for record breaking albums and appearance to public as celebrity.

One of the strange reports is the conversion/adoption of POP music by Neuroscientist or Neuroscience students, Poland's neurologist turned pop singer (Kuba¹⁰) and UK's celebrity (Emeli Sande¹¹). Presently, we don't have any ground to explain this observation on factorial basis.

STRATEGY AND RECOMMENDATION

Obviously, it is important that neuroscientist should investigate for an optimally maximum strength of voice, loudness of sound, intensity of lights and physical movements which are to be maintained during a concert and thus to prevent the danger of incidents like great music giant Michael Jackson/Britney Spears (chronic cases), Professor Jonathan (probably acute) and probably happening to a lesser or greater extent to every other celebrity engaged in this profession. The first line strategy should be to record and compare the electrical activity in the form of EEG using all leads during performance of a celebrated pop singer, a person listening to it with interest, a person who is listening to soft music or other than POP and a person not used to listen music at all. Later, on advance studies may be performed on both human and animal models to compare the electrical surge if any in chronically exposed and non-exposed persons/animals to high intensity sounds, light along with hyper body movements.

It is recommended that both the transverse and longitudinal neuro-physiological studies (both macro and micro levels) are to be conducted on persons who

are engaged in this profession and also to chronic listeners to prevent them to become patho-physiological cases by optimizing their activities and environment and enjoy the beneficial music only, if desired.

Note: *The author of this article is neither a POP singer nor a listener. The death of a neuroscientist motivated him to write on the basis of information available regarding POP singers over the internet along with facts of neuroscience.*

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