

Preliminary Encounters of UNIMAS Sleep Laboratory

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This report describes the importance of sleep to each and every one of us and what complications may arise if the sleep disorders experienced are left unchecked. Sleep electroencephalography at the UNIMAS sleep laboratory is a method of investigative procedures, which is non invasive and can provide useful data to help the clinicians in formulation of diagnosis and arriving at the best possible treatment strategies for the patients. Four clinical problem cases have been mentioned, namely disturbance of level of consciousness, cognitive impairment, emotional disorder and hypersomnolence. The results of the sleep electroencephalography done have shed some light into the nature of the underlying disorders. (Sleep and Hypnosis 1999;1:29-31)

Key words: sleep electroencephalography, consciousness, intellectual impairment, depression, hypersomnolence

INTRODUCTION

In the investigation of sleep disorders it is essential that one understands the causes of the complaints presented by those suffering from the disorders themselves. Insomnia for instance is a common symptom experienced by many people, however not many of these people come forward to seek treatment and in the United States it has been reported that only 5% actually received consultation (Gallup, 1991)(1). Looking from the perspectives of cognitive functioning, it is one's own perception and appraisal which can determine one's own behaviour. Therefore it is entirely up to the individual to conclude what actually is the meaning of the insomnia to him or her and to what extent would the person seek help to address the problem the person is facing.

If we were to ask a person who has not been sleeping well, when he or she just got up from the bed in the morning, what he or she feels like, we would certainly

received a negative answer. This unsatisfying negative feeling would influence the cognition and the behaviour of the person. Whereas on the other hand if the individual has a satisfying and adequate number of hours of sound and quality sleep, then the individual is ready to face the tasks ahead and would be ready to assume the roles expected and could therefore be productive.

To help investigate the sleep efficiency, one can subject the individual concerned to an electrophysiological study in the form of a polysomnogram recording or electroencephalography. This is an investigative tool which can record the various sleep stages the individual goes through during the sleep and therefore the sleep architecture can be analysed. In addition with extra appliances, the investigator could also assess other sleep parameters which are essential to document that a satisfactory sleep is obtained.

1. Disturbance in the level of consciousness

In terms of fluctuating level of consciousness, the electroencephalography can objectively demonstrate the absence or presence of cerebral involvement. This aspect is used at times to distinguish whether someone who claims of having disturbances in the level of awareness, is really having an organic problem, involving brain pathology or just a functional problem, which does not involve physical damage to the brain but instead suffering from emotional turmoil. This investigative procedure which can discriminate the two different causes would contribute significantly towards the management strategies for the patients. As an example of a truly organic cause of fluctuating level of consciousness would be epilepsy, and

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Acknowledgements: We wish to thank UNIMAS for the support, Sarawak General Hospital for the facilities provided and the Ministry of Science and Environmental Technology for the IRPA grant 06-02-09-0203 "Treatment of Insomnia Patients with Sleep Disorders at Sarawak General Hospital".

this could be recorded in the electroencephalogram, whereas a non organic or functional level of consciousness could be associated with hysterical conversion or dissociative reaction.

Case illustration

A 12 years old school girl presented with episodic disturbance of consciousness, associated with tonic clonic movements of the right upper limb with associated right facial abnormal movements. Sleep electroencephalography done showed secondary generalised abnormal discharges. She was treated with anticonvulsant carbamazepine and is now symptom free. In this case the pathological cerebral discharges, as shown in the electroencephalography tracings, contributed to the signs and symptoms manifested.

2. Disturbance intellectual function

Similarly in cases of intellectual deterioration such as failing memory, example due to cerebral tumour in the parieto-temporal lobe or due to degenerative disorders like Alzheimer's dementia, in addition to other investigative tools like radiological investigation and psychometry, one can use electroencephalography technique to demonstrate changes in brain wave pattern. Forstl (2) showed significant deterioration in the cognitive function accompanied by neurophysiological changes in patients with Alzheimer's disease.

Cognitive impairment such as this can be correlated with the structural damage in specific cerebral areas, thereby helping clinicians and therapist to understand the pathophysiology of cognitive function. This is one area where a sleep laboratory can contribute to the understanding of the mechanism of our thinking processes.

Case illustration

A 50 years old school teacher presented with a 6 months history of frequent headache, not responding well to analgesics. She has episodes of memory loss, speech difficulties and marked loss of weight. Radiological investigation showed a cerebral tumour at the left parieto-temporal region, and psychometric assessment showed deterioration in cognitive functioning. Electroencephalography recordings showed marked slow waves over the affected cerebral area.

This case illustrated the importance of utilising the relevant investigative methods to assess the underlying condition as well as to provide baseline information for monitoring responses to therapeutic interventions.

3. Disturbance in emotional state

Another relevant use of polysomnogram in assessing the working of the mind is to look at individuals with severe depressive mood. Depressed people cannot sleep satisfactorily and their sleep architecture, sleep efficiency and sleep latency are abnormal. Julien (3) showed there are specific sleep-electroencephalography changes in major depression. These include increased sleep-onset latency,

decreased total sleep time and sleep efficiency, rapid eye movement sleep density increased. Since depression is a treatable condition, perhaps another electroencephalograph done after recovery would help to confirm and showed the level of improvement in the patient.

Case illustration

A 19 years old female college student found difficulties in coping with her studies, developed social withdrawal, loss of interest, marked insomnia, crying spells and harboured negative thoughts about her future. Clinical assessment showed dominant features of severe depression and sleep electroencephalography demonstrated marked sleep architecture disturbance. Sleep efficiency was 84 %, marked REM stage sleep, delayed sleep latencies and minimal deep sleep periods which are in keeping with depressive picture.

4. Disturbance in daytime hypersomnolence

A number of people in the community suffer from a sleep disorder called obstructive sleep apnoea, where they tend to have multiple awakenings at night and as such they do not have an adequate number of hours of sleep. In the day time these people tend to be less alert, and have the tendency to fall asleep easily at inappropriate times. This phenomenon can cause embarrassment at times and sometimes can be hazardous (4). The reasons for the frequent awakenings are mostly due to blockage of the airway because of physical deformities of the respiratory systems. In addition to daytime hypersomnolence these people may also acquire other medical complications related to the cardiovascular systems if the disorder is left unchecked.

The use of polysomnogram in these conditions can assess the severity of the disorder and thereby help in deciding the appropriate intervention to alleviate the signs and symptoms. Besides obstructive sleep apnoea, daytime hypersomnolence can also be seen in cases of narcolepsy, and the multiple sleep latency test can be useful in the evaluation of these patients.

Case illustration

A 45 years old obese gentleman presented with 4 years history of heavy snoring, accompanied with episodic cessation of breathing and frequent awakening during sleep. In the daytime he experienced sleepiness and has on a number of occasions being almost involved in motor vehicle accidents. Physical examination showed narrowed airway, with enlarged tonsils, pendulous uvulus and excessive mucosal folds.

Polysomnogram studies showed he has frequent awakening during the sleep leading to reduced sleep efficiency of about 77%. He has frequent obstructive apnoea of average duration 21 seconds and hypopnoea events of average duration 31 seconds and these episodes are associated with a severe oxygen desaturation of 65% and 70 % respectively. The respiratory disturbance index is equally high which reaches 27. These findings show the patient has a moderately severe sleep apnoea syndrome. As

far as therapeutic intervention is concerned, this man needs surgical treatment of the upper airway.

DISCUSSION

Sleep is essential for survival, just like food where one derives one's energy, adequate number of hours of sleep will ensure one wakes up fresh and is ready to face the challenges ahead. Sleep electroencephalography as done at the UNIMAS sleep laboratory provides the facilities to investigate sleep and sleep disorders and as has been illustrated it is beneficial both to the patients and the clinicians so that the investigator can really understand and be precise in his or her formulation of diagnosis in order to make the best clinical judgement in the management of the patients. There are numerous causes of insomnia and some patients need pharmacological interventions where as some does not. This technique can help to screen those patients that may benefit from prescribing drugs and some may be helped by other non-pharmacological strategies.

As a result of inadequate number of hours of sleep, one will be exposed to a series of undesirable eventualities. The impact may not be seen immediately but with the passage of time, the individual concerned will show the signs and symptoms of sleep disorders. Sleep studies can take the role of preventive medicine where early signs of disorders of one's health can be investigated and corrected if necessary. The related medical conditions associated with abnormalities in the sleep pattern have been mentioned and one need to note that in some of these cases the complications can be serious.

Everybody is looking forward to a good night's sleep and is hoping that when one gets up in the morning, one feels comfortable and is ready for another productive day. Sleep may be said to be one of the simple pleasures of life and only those with sleep disorders, experience how painful it can be when they cannot sleep adequately and their cognitive perception will eventually determine what measures they should resort to in order to alleviate their agony.

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