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Review Paper

Neurobics: A Brain Booster

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ABSTRACT

'Neurobic' is a latest approach in the field of neuroscience which exercises our brain and removes or prevents all blocks or knots of our brain to strengthen our memory as well as to make our brain smarter while ageing. Neurobic can be done by changing our daily routine of work and performing it in another way, say for new way as a challenge. Neurobic helps one to develop new or undeveloped brain cells, dendrites or neurons. It also includes playing games such as puzzles, computer games, cards, word search, golf or tennis, walking, swimming, yoga and dancing. Hormonal imbalance is a root cause of several problems like anxiety, depression, psychological strain, mental illness of different kind and so on. Neurobic comes as a cure to all these through different exercises which involve all the five senses.

.**Keywords:** *Neurobics, Knots, Memory, Neurons, Exercises*.

INTRODUCTION

Since all the activities of our body are regulated and controlled by brain, we must exercise and take care of it in the way we do for our body. A very fascinating fact about our brain is that even after attaining a certain age when every part of our body stops growing, the cells of brain can be stimulated to enhance our memory. By adopting some newer technologies we can easily combat with problems like mental agility. Neurobics is an approach which maintains our mental fitness, strength and flexibility as we grow older. Neurobics involves all our six senses responsible for vision, smell, touch, taste, hearing and sense. It enhances our neural activity and release neurotrophins which act as natural brain tonic and increase the size of nerve cell dendrites and as well as strengthen the nearby cells. It activates various brain areas to enhance the range of our mental motion (Katz, 2000). The term Neurobics was first of all brought in existence in 1999 (Ballard, 2010). Neurobics deals with brain exercise *i.e.* performing our daily task in different ways. Its main aim is to improve our memory or brain power. It is done by using our non dominant hand (left hand usually) to eat, write and brush our teeth. By showering or navigating a room with closed eye, rearranging our place, by having our food in a reverse way like taking desert first, by reading a book or magazine of totally new field, reading a paragraph in upside down manner, making puzzles, communicating, making personal goals and by reading numbers in Braille. Neurobics includes long walking as it affects the dominancy of right and left brain across the midline of our body. As various aerobic exercises are done for our muscles and to make our body fit in same way is done to improve our mental health by developing new dendrites and neurons (Ballard, 2010). Neurobics increases the connections between the neuron, hence our memory is improved (Kanthamalee and Sripankaew, 2014). According to the use and disuse theory of Lamark (1744 -1829), the part of a body that has not been used for long time may

become smaller and even disappear whereas the part of the body that are used frequently becomes more developed. Memory lies in our cortical areas, the stronger is the network associations in our brain and stronger is our brain memory (Katz, 2000). Physical activities also improve our cognitive function and enhance our brain development (Hillman *et al*., 2008). Brain utilizes 20 – 30% of total oxygen taken of our body. As blood circulation of our body increases, the supply of glucose and oxygen to our brain also increases. Exercise boosts the mind *i.e.* it pumps in all good components whereas pumps out all bad stuffs. We can also say that neurobics is not much differ from aerobics. The basic thing about s is that it smoothes the transmission of impulses through synapses, it enables old neuron to grow new dendrites. Hippocampus in our brain is responsible for memory. More the quantity of neuron is present in our brain, the sharper is brain. So brain can grow, adapt and change patterns at any stage. Due to certain regions or brain nutrient *i.e.* neurotrophins, sometimes it forms blocks or knots in our brain region, ss prevents all these problems and make our brain smarter. Various yogas can also be considered as neurobics as yoga breathing through a specific nostril (right, left or alternate nostril) enhances spatial memory scores without lateralized effects (Naveen *et al*., 1997) and it also offers a sort of exercise to brain and promotes neurogenesis (Fig. 1).

Fig.1

In the same way neurobics is practiced in order to activate the inactive part of the cells of our brain. It may act as a boon for people those who are unable to express themselves and suffer a lot in this competitive world.

NEURONAL CONDUCTION IN BRAIN

Our brain consists of trillions of neurons. The function of neuron is to transfer impulses from central nervous system (CNS) to peripheral nervous system (PNS) or vice versa. This transfer of impulses is also called as neuronal communication. It is of two types – electrical communication and chemical communication. In electrical communication the activity within the neuron is electrical i.e. via action potential (positive and negative charges) whereas in chemical communication impulses are in the form of chemicals *i.e.* neurotransmitters (dopamines, serotonin, acetylcholine, norepinephrine, glutamate and GABA). Neurons mainly have two parts *i.e.* cell body or cyton and cellular processes. These cellular processes may be of two kinds dendron and axon. The bushy dendrites are specialized to receive signals from any organ of our body and prescribe them to cell body. Afterwards signals are transferred to the axon and to the axon terminal (Tortora and Derrickson, 2006).

WORKING OF NEUROBICS

The dense network of neuron sometimes leads to the formation of knots in the brain. These knots act as huddles in the way of communication of neurons. These knots can be viewed by MRI and brain scanning devices. Neurobics play an important role in correcting these knots. Knots can affect 5 different areas of our brain. These are deep limbic system, basil ganglia system, pre frontal cortex, cingulate system, temporal lobes (Rodski, 2012).

NEUROBICS AS EXERCISE

For Neurobics we need not need to exercise every day in busy schedule but it needs just two works we often neglect in our daily schedule. First one is to always be ready to experience unexpected things and second is to use all our senses in our daily routine. The most important thing is that every exercise needs our motivation. Neurobics is based on our daily routine work *i.e.* communicating, shopping, eating, getting up and relaxing (Bacon, 2005). Our medulla oblongata contains a pyramid where 90% of the axons from the left pyramid goes to the right side, and 90% of the axons from the right pyramid goes to the left side. This crossing is known as discussion of pyramids (Tortora and Derrickson, 2006). So that, in a right handed person for handling a pen with right hand, left cortex of our brain is involved whereas in left handed person right cortex is involved. Changing oneself from right handed to left handed activates our right cortex (large network of connections, circuits and brain areas) which are rarely used. This makes our brain to tackle with a totally new task which is challenging, engaging and also frustrating (Pugh, 2012).

: There are few conditions described below that make an exercise Neurobics:

INVOLVING OUR SENSE

Using our senses in different way instead of our ordinary style i.e. by getting dressed with eyes closed, having a meal with whole family in silence, listening to a particular music and smelling a specific fragrance (Katz, 2000).

ENGAGING ONE'S ATENTION

We can engage our attention by standing out from daily schedule and do something that is completely different from our daily schedule such as taking our family to the office, reading something upside down, using non-dominant hand instead of dominant hand (Katz, 2000).

BREAKING OUR DAILY ROUTINE IN AN UNEXPECTED WAY

By performing any work in completely different manner (Katz, 2000).Buying fruits directly from farm, instead of fruit shop.

TRAVELLING

It stimulates our brain. It led early *Homo sapiens* to develop survival skills and various tools for their survival and defence.

SOCIALIZATION

It serves an opportunity to exchange our ideas and reflect on that.

BRAIN REGIONS INVOLVED IN MEMORY

In human brain cortex is responsible for memory, language and thoughts. Hippocampus

in our brain is responsible for memories as it synchronizes incoming sensory information from the cortex (Edmund, 1996). Hippocampus is very essential for mental map, as it is responsible for making various memories such as where car is parked, how to rich home *etc*., therefore if hippocampus is removed from any animal then it cannot remember even simple things (Katz and Rubin, 2000). Hippocampus is located within brains's medial temporal lobe. It's main function is to regulate emotions and it is also responsible for long term memory (Eichenbaum and Dusek, 1997). Therefore any damage in hippocampus region of our brain may cause diseases like Alzheimer. Cortex consists of around one hundred million of nerve cells in every square inch (Katz and Rubin, 2000). Long-term memories are encoded within definite patterns of synapses in the cortex, the irregular folds and ridges of the cerebral cortex which is located on the outer layer of the brain, complex mental processing takes place. The frontal lobe of the cortex, particularly the prefrontal cortex (the area behind the forehead), is vital for high-level mental functions such as reasoning, planning, and judgment. The hippocampus, the amygdala, and neighbouring structures within the medial temporal lobe are responsible for memory processing system and are important for short-term or "working" memory as well as emotionally charged memories (Ergorul and Eichenbaum, 2004). These structures are associated to the cortex by complicated systems of neural circuits that transfer messages to and fro (2009, NRTA)

BRAIN CELLS AND NEUROBICS

In most people mental decline is not due to the death of nerve cells, instead, it generally caused due to the diminishing and complication of dendrites. The dendrites of nerve cells that directly receive and relay information from other nerve cells forms the basis of memory. Dendrites receive information across associations of synapses. Growing dendrites was long thought to be possible only in the brains of children. But more recent proves that neural circuits in adult brains too have the capacity to undergo dramatic changes (Harshaw and Ronald, 2011). It stimulates nerve cells to produce natural brain nutrients, called neurotrophins, which can significantly increase the size and complexity of dendrites of neuron. Neurotrophins strengthens the surrounding cells and defend aging problems. Neurobics exercises use all five senses in different manners to enhance our brain power (Katz and Rubin, 2000).

EFFECT OF EXERCISE ON BRAIN

In the field of neuroscience, Neurobics is a newly developed approach which deals with exercise of brain (Fig.2). Exercise reduces gray matter loss, promotes neurogenesis, strengthens neural connection, changes gene activation patterns, pumps up growth factors and enhances blood flow (NRTA, 2009). Neurobics is an exercise of brain by which all the nerves of our brain is pumped, hence prevent memory loss. Here are some ways by which Neurobics can be done anywhere at any time (Gina and Shaw, 2012).

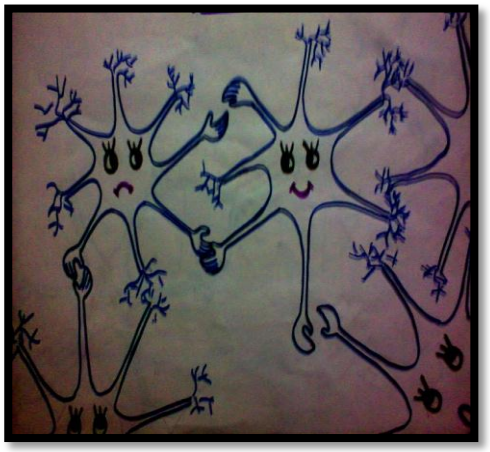

Fig.2

CONCLUSION

Neurobics is a mental exercise. The way aerobic is done for healthy body in the same manner Neurobics is done for healthy mind. While ageing, one of the biggest fears is of deteriorating memory, dementia or Alzheimer disease. Neurobics helps in unlocking of knots by removing blocks in our brain and nervous system. It enhances and stimulates the free flow of information. It is the result of work done of methods of yoga and acupressure. By adopting Neurobics in everyday life can get a brain functioning at maximum capacity. We all know about all the senses from childhood, but sometimes while growing some of the pathways can be closed off. Neurobics enhances these pathways and helps in opening of circuits of learning. Just like muscular strength, memory increases if exercise brain and nurture it with healthy diet and habits. Physical exercise and engaging our brain with intellectually stimulating activities not only enhances memory, it also gives brain a vast protection against disease or injury while ageing.

REFERENCES

1. Bacon, E. 2005. Neurobics: The New Science of Brain Exercise. 5: 1-13.
2. Ballard, D. 2010. Improve Health with Neurobics. *Emergency Medicine News*. 32: 1-5.
3. Edmund, T. R. 1996. A Theory of Hippocampal Function in Memory. *Hippocampus*. 6: 2763-2268.
4. Eichenbaum, H., and Dusek, J. A.1997. The Hippocampus and Memory for Orderly Stimulus Relations. 94: 7109-7114.
5. Ergorul, C., and Eichenbaum, H. 2004. The Hippocampus and Memory for "What", "Where", and "When", Learning memory. 34: 557-564.
6. Gina, H., and Shaw, P. 2012. Neurology News: Neurologists Asked to Prove for Violence. *Neurology Now*. 8: 10-12.
7. Harshaw and Ronald, H. 2011, Neurobics. *Neurology Now*. 7: 5-10.
8. Hillman, C. H., Erickson, K. I. and Kramer, A. F. 2008. Be Smart, exercise your heart:exercise effects on brain and cognition. *Nature Reviews Neuroscience*. 9: 58-65.
9. Kanthamalee, S., and Sripankaew, K. 2014. Effect of Neurobic Exercise on Memory Enhancement in the Elderly with Dementia. 22: 875-884.
10. Katz, L. C. and Rubin, M. 2000. Keep Your Brain Alive, 83 Neurobic Exercises, Workman Publishing Company, New York. 1: 1-81.
11. Naveen, K. V., Nagendra, R. N. H. R. and Telles, S. 1997, Yoga Breathing through a Particular Nostril Increases Spatial Memory Scores without Lateralized Effects. *Psychological Reports*. 81(2): 555-561.
12. NRTA (National Retired Teachers Association), 2009. Successful Aging and Your Brain. *Dana Alliance for Brain Initiatives*. 1-31.
13. Pugh, D. 2012. Exercise and Educating your Child. 3: 1-6.
14. Rodski, S. 2010. Neurobics for the brain. *Corporate Health Solutions*. 1-4,
15. Tortora, G. J. and Derrickson, B., 14th edition, Principles of Anatomy and Physiology. *Wiley*. 1-1237.