

TREATING IDDM WITH BCG VACCINE

In a study from Harvard Medical School, adults with long-standing type-I diabetes who were administered two doses of BCG (4 weeks apart) were followed up for 8 years. They showed a remarkable recovery of HBA1C levels to near normal with no episodes of severe hypoglycemia at the end of three years which remained stable for the next five years. How did that happen? The mechanism is fascinating.

Man and mycobacteria have coexisted for more than 90,000 years. Chronic infection of man by mycobacteria is possible by its effect on increasing number and function of regulatory T cells (Tregs) in man. It has been previously documented that these regulatory T cells play a key role in preventing various autoimmune disorders. The BCG vaccine probably works by upregulating these Tregs. In the study published in *Nature*, scientists documented that BCG induces methylation of genes resulting in increased mRNA of these Tregs.

However, inoculation with BCG did not increase insulin production from the pancreas. How then did it reduce sugar levels? It induced a switch of glucose metabolism from oxidative phosphorylation where less glucose is used up, to aerobic glycolysis where large amounts of glucose are used up. Aerobic glycolysis is usually seen in areas of local inflammation (*e.g.*, tubercular abscess) where oxygen levels are low. The data suggest that BCG would work independent of cause of hyperglycemia. Thus it may work even in non-autoimmune diabetes. BCG has also been shown to be useful in other autoimmune disorders such as multiple sclerosis. It has also been shown to protect against other infections like typhoid, herpes and candida. The article concludes with a prophetic statement: “we are only beginning to appreciate the evolutionary synergy of the reintroduction of the *Mycobacterium bovis* attenuated BCG organism into modern day humans.” (*npj Vaccines* 21 June 2018)

WHO GLOBAL ACTION PLAN ON PHYSICAL ACTIVITY

Eighty one percent of adolescents (age 11-17 y) do not meet WHO global recommendations for physical activity. Changing patterns of transportation, urbanization, and increasing use of technology are some of the reasons. Girls and those with disabilities or chronic illnesses are at higher risk. According to the WHO, 1-3% of national health expenditure is attributable to physical inactivity. There are other potential environmental benefits of people walking or cycling to work. With more than 70% of the population living in urban spaces, policies that encourage walking, cycling and leisure areas will make huge differences.

The WHO has announced a Global Plan with a mission to ensure that all people have access to a safe environment for physical activity in their daily life. The target is to reduce prevalence of physical inactivity by 15% among adults and adolescents by 2030 as compared to 2016. Action plan includes community and national awareness campaigns about benefits of physical activity. The next step is to target urban planners to create safe environment for walkers and cyclists, and also to develop open spaces conducive to physical activity and sports. Further, the aim is to provide good quality physical education in schools and colleges to develop lifelong habits of physical activity. Finally, advocacy and research into this area will be encouraged.

“Go out and play” should be the clarion call of every pediatrician.

(*Global Action Plan on Physical Activity 2018-2030* <http://apps.who.int/iris/bitstream/handle/10665/272722/9789241514187-eng.pdf>)

BORN IN GUANGZHOU COHORT STUDY

Guangzhou is one of China’s largest urban agglomerations. Which is a euphemism, for a city too vast to be called a city. It is one of China’s most prosperous – albeit polluted – urban sprawls. China has seen enormous social, economic and environmental upheavals in last few decades. What are the effects on the health and development of children? These are the questions which are being answered by this ambitious study. They are following up more than 33,000 mother-baby dyads from inception to adolescence.

Extensive data, including eating habits, lifestyle habits, mental health and environmental information is being collected. Unique to this study is the large amount of biological samples being collected. Already useful data is emerging. They have found a strong association between incense stick burning and hypertension in pregnancy. Another interesting finding has been that early use of progesterone to prevent preterm births was associated with an increase in post partum depression.

There have been four large birth cohort studies in the world so far. Two of them (The National Children Study from the US and the Life Study from UK) had to be shut down due to spiraling costs. The Norwegian Mother and Child Cohort study (MoBa) and the Danish National Birth Cohort, however, have managed to recruit 90,000 and 100,000 children so far, and are following them up till adolescence. Now is the era of big data and we will glean much from intelligent data mining. (*Nature* 2 July 2018)

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