

Saraswati Dental College, Faizabad Road, Lucknow

Science Update Notice Board

January 2015

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Featured Research

Tooth loss linked to slowing mind, body

December 18, 2014

University College London

The memory and walking speeds of adults who have lost all of their teeth decline more rapidly than in those who still have some of their own teeth, finds new research. The association between total tooth loss and memory was explained after the results of a study were fully adjusted for a wide range of factors, such as sociodemographic characteristics, existing health problems, physical health, health behaviors, such as smoking and drinking, depression, relevant biomarkers, and particularly socioeconomic status. However, after adjusting for all possible factors, people without teeth still walked slightly slower than those with teeth.

- The study, published in the *Journal of the American Geriatrics Society*, looked at **3,166 adults aged 60 or over** from the English Longitudinal Study of Ageing (ELSA) and compared their performance in tests of memory and walking speed. The results showed that the people with none of their own teeth performed approximately 10% worse in both memory and walking speed tests than the people with teeth.
- The links between older adults in England losing all natural teeth and having poorer memory and worse physical function 10 years later were more **evident in adults aged 60 to 74 years than in those aged 75 and older**.
- **"Tooth loss could be used as an early marker of mental and physical decline in older age, particularly among 60-74 year-olds,"** says lead author Dr Georgios Tsakos (UCL Epidemiology & Public Health). "We find that common causes of tooth loss and mental and physical decline are often linked to socioeconomic status, highlighting the importance of broader social determinants such as education and wealth to improve the oral and general health of the poorest members of society.
- **"Regardless of what is behind the link between tooth loss and decline in function, recognising excessive tooth loss presents an opportunity for early identification of adults at higher risk of faster mental and physical decline later in their life.** There are many factors likely to influence this decline, such as lifestyle and psychosocial factors, which are amenable to change."

From a Pile of Dirt, Researchers Discover New Antibiotic

Biomedicine News: 07 Jan 2015

The first new antibiotic to be discovered in nearly 30 years has been hailed as a ‘paradigm shift’ in the fight against the growing resistance to drugs.

Teixobactin has been found to treat many common bacterial infections such as *Clostridium difficile*, *Mycobacterium tuberculosis* and *Staphylococcus aureus* and could be available within five years. But more importantly it could pave the way for a **new generation of antibiotics** because of the way it was discovered.



A **new** microfluidic device lets scientists identify a powerful drug from nature. Hard-to-grow bacteria flourish inside this **microfluidic chip that acts as a portable diffusion chamber** developed by **Slava Epstein**, a Biologist at Northeastern University in Boston.

The researchers diluted dirt, including some from their own backyards, to capture a **single soil microbe in each of 306 tiny holes** on the chip’s surface. They then put the chip in a tub of dirt, allowing the germs to remain in their natural environment. “Essentially, we’re tricking the bacteria,” says **Kim Lewis**, Director of the Antimicrobial Discovery Center at Northeastern University, who led the research. Lewis says his team was able to grow colonies of bacteria robust enough to be transferred to a petri dish, where they could be tested to see if they produced antibiotics. “Apparently the bottleneck in growing bacteria is to achieve that first colony,” says Lewis. “Once that happens, they become domesticated.”

Scientists have always believed that the soil was teeming with new and potent antibiotics because bacteria have developed novel ways to fight off other microbes. But 99 per cent of microbes will not grow in laboratory conditions leaving researchers frustrated that they could not get to the life-saving natural drugs. A team from Northeastern University in Boston, Massachusetts, has discovered a way of using **electronic chip to grow microbes in the soil and then isolate their antibiotic chemical compounds**. Professor Kim Lewis, Director of the Antimicrobial Discovery Centre said: “Apart from the immediate implementation, there is also I think a paradigm shift in our minds because we have been operating on the basis that **resistance development is inevitable** and that we have to **focus on introducing drugs faster than resistance**.” The research was published in the journal *Nature*.

“Teixobactin shows how we can **adopt an alternative strategy** and develop compounds to which bacteria are not resistant.” The first antibiotic Penicillin was discovered by Alexander Fleming in 1928 and more than 100 compounds have been found since, but **no new class has been found since 1987**. Antibiotics have been magic bullets for human health for decades. The **lack of new drugs coupled with over-prescribing and irrational use has led bacteria to become increasingly resistant to modern medicines**.

QUOTE OF THE DAY

Smile when picking up the phone, the caller will hear it in your voice.

Scientists develop a new 'Biomimetic Crystalline Dentin Barrier'

MedicalNewsToday: 08 Jan 2015

Loss of enamel layer that covers our teeth results in sensitive teeth and raises risk of cavities, pulp inflammation and other dental diseases. Scientists have produced a new biocompatible material that potentially rebuilds worn enamel, reduces tooth sensitivity and is much longer-lasting than the current treatments. Chun-Pin Lin, Professor of Dentistry & colleagues at National Taiwan University report how they developed the new material, which they tested on dogs, in the journal ACS Nano.

Tooth sensitivity due to loss of enamel is one of the most common dental problems. It not only causes sharp pain and anxiety, but it can herald more serious dental problems. Loss of tooth enamel exposes a layer of softer, porous material called dentine, which is full of thousands of tiny channels or tubules that go deep into the pulp of the tooth where the nerves lie. When dentine tubules are exposed, heat and cold pass more easily to the underlying nerves. Available treatments e.g. special toothpastes incorporating sealants work by blocking tubules at the exposed dentine surface. But these **seals do not last and get worn away with chewing & brushing.**

New material generates a 'Biomimetic Crystalline Dentin Barrier'

In their paper, Prof. Lin and his team describe how they made and tested a **reliable, fast-acting biocompatible material containing main elements found in teeth: calcium and phosphorous.** Applied to teeth in the form of a paste, the biomaterial **seals the exposed dentinal tubules to produce** what the team describes as a "**Biomimetic Crystalline Dentin Barrier**". When they tested it on dogs' teeth, the team found the new material plugged the exposed dentinal tubules more deeply than other treatments. To make the material, the team produced a silica-based template containing nano-sized calcium carbonate particles and mixed it with phosphoric acid (H₃PO₄). This enabled calcium and phosphate ions to work their way deep into the dentinal tubules and crystallize into various forms of calcium phosphate. Tests on the dogs' teeth revealed "**significant crystal growth**" and "**no pulp irritation after 70 days**". The new biomaterial "holds great promise for treating exposed dentin by growing biomimetic crystals within dentinal tubules," and may serve as "both a catalyst and a carrier in the repair or regeneration of dental hard tissue."

A 2008 survey conducted by the Centers for Disease Control and Prevention (CDC) found that over 26% of adults aged 18-64 in the US had experienced toothache or sensitive teeth in the preceding 6 months. **Women were more affected than men,** and the 18-34 group was more affected than the 55-64 group.

Wear and tear through brushing too hard using hard-bristled brush can cause sensitive teeth. **Poor dental hygiene not only leads to tooth decay and gum disease, but has also been linked to more serious consequences such as Alzheimer's disease, pancreatic cancer and heart disease.**

QUOTE OF THE DAY

Your dream is not that which you see while sleeping, it is something that does not let you sleep - APJ Abdul Kalam

<http://dentistrytoday.com/todays-dental-news/9936-tooth-decay-may-prohibit-growth-in-children>

Tooth Decay may Prohibit Growth in Children

Tooth decay may be even worse than originally thought.

A new study suggests that **tooth decay may push back growth in children**. The study appeared in the online version of *Pediatrics* journal and was conducted at University College London and King Fahad Armed Forces Hospital in Saudi Arabia. The research team wanted to explore relationship between oral health and growth. In this study, the **researchers looked at the dental decay and the correlation between height and weight in Saudi Arabian children ages 6 through 8**.

Oral health of the children was graded on **DMFT scale**, which determines the seriousness of decayed, missing and filled teeth. The research team later analyzed the statistics and concluded that there was, in fact, a **relationship between low height/weight and greater number of cavities**. **Children with severe decay had a higher chance of being underweight and shorter when compared to their peers**.

Even when some secondary factors, like demographics and social values, were factored in, the correlation between decay and stunted growth still existed. Based on this study, it's fair to say **there is an inverse relationship between growth and tooth decay in children**.

ADA Recommends Earlier Fluoride Distribution for Children

It may be beneficial for children to be given fluoride even earlier than they receive it now, according to the American Dental Association. Previous information suggested children receive fluoride by the time they were 6. This new information, however, suggests that children be administered fluoride even earlier. The new ADA recommendation states that **children should be given fluoride as soon as their first teeth develop**.

When children use fluoride toothpaste at an early age, it can lower the rate of decay. Research suggests that around **one quarter of children develop a cavity before reaching kindergarten but more children using fluoride at an earlier age can lower that number**. The study also indicated that **pea-sized quantities of toothpaste can lead to a higher risk of fluorosis when toothpaste is ingested**. Children younger than 3 should use smaller amounts of toothpaste. The ADA recommends parents watch their children clean their teeth to make certain the children spit out the toothpaste as opposed to swallowing it.

QUOTE OF THE DAY

Happiness lies in the joy of achievement and the thrill of creative effort.

- Franklin D. Roosevelt