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A coil in the stomach for better TB treatment

April 13, 2019/The Hindu

The treatment of tuberculosis is becoming more difficult as most patients don't adhere to the treatment regimen which includes six to nine months of daily antibiotics. This also contributes to emergence of multidrug-resistant bacteria.

Now, researchers from Massachusetts Institute of Technology, U.S., have developed a coil loaded with antibiotics that can stay in the stomach for up to a month and release the necessary drugs in the required doses. This eliminates the need for daily administration and also brings down the cost of treatment. The coil is made of a nickel-titanium alloy (nitinol) and looks like a small slinky toy. Just like adding beads on a string, the researchers added 600 pills (4 mm height and diameter) of different formulations to the coil. The drugs used included doxycycline hyclate, isoniazid, ethambutol, pyrazinamide, moxifloxacin, and rifampicin. The pills were spray coated with a special polymer which enabled controlled release of the drug. The final coil measures 32 mm in thickness and when stretched out is around 2 metre in length. The coil can be retrieved via the same nasogastric route by inserting a tube which attaches to the magnet on the coil. Ms. Verma added that further work is being carried out to understand the acceptability and feasibility of the system during insertion and retrieval. The team anticipates initial human trials to begin in the next five years. The researchers spoke to 300 tuberculosis patients and over 100 TB health providers in India and noted that most of them were open to the idea of a monthly administration using this coil.

"In many cases, this was preferred by the patients, who could come to a health-care setting every two weeks or every four weeks instead of having to be seen by a health care provider every day," says Prof. Giovanni Traverso from MIT's Department of Mechanical Engineering in a release. He is one of the corresponding authors of the paper published in Science Translational Medicine. The team also analysed the economic impact of this new treatment regimen and the paper notes that the cost could be reduced by "more than \$8,000 per patient"

Stem cell protein may help find blood cancer cure

April 13, 2019/The Tribune

Researchers have identified a stem cell protein that may play an important role in finding cure for blood cancer. The study, done on mice, suggests a stem cell protein called Asrij is a novel regulator of wild type tumour suppressor p53 stability in hematopoietic stem cells (HSCs). It could help design targeted therapies for myeloproliferative disease, a group of slow-growing blood cancers, according to researchers, including Maneesha S. Inamdar from the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) in Bengaluru. "We provide a new mouse model resembling myeloproliferative disease and identify a post-translational regulator of wild type p53 essential for maintaining HSC quiescence that could be a potential target for pharmacological intervention," the team said. According to the study, published in the journal Blood, inactivation of the tumour suppressor p53 is essential for unrestrained growth of cancers. But only 11 per cent of hematological malignancies have mutant p53.

Mechanisms that cause wild type p53 dysfunction and promote leukemia are inadequately deciphered, suggests the study. The stem cell protein Asrij is misexpressed in several human hematological malignancies and implicated in the p53 pathway and DNA damage response, the team said. For the study, the team generated the first Asrij null (knockout, KO) in mice and showed they are viable and fertile with no gross abnormalities. However, by six months, they exhibited increased peripheral blood cell counts, splenomegaly and an expansion of bone marrow HSCs with higher myeloid output

Multiple checks give right BP, says study

April 14, 2019/Hindustan Times

Repeated blood pressure (BP) measurements are more representative of the true BP status of an individual as compared to a single reading that is usually taken and can actually show higher disease prevalence, a new study has said.

Titled “Impact of Repeated Blood Pressure Measurement on Blood Pressure Categorisation in a Population-Based Study from India”, the study that appeared in Nature’s Journal of Human Hypertension on Friday found 63% higher prevalence of hypertension when only the first reading was considered for diagnosis in comparison to the mean of the second and third readings.

The information was analysed from BP readings taken to generate data for the National Family Health Survey (NFHS-4), a nationwide survey conducted in India in 2015-2016. Although the general consensus is that there should be multiple readings, there are no clear-cut guidelines on how many readings are good enough. Most doctors rely on a single reading primarily due to time constraints.

“Most people take one reading but, ideally, there should be at least three as usually the first reading is always on the higher side because when a patient walks in, he or she is usually a bit anx

Allergy season worsens with changing climate

April 14, 2019/Hindustan Times

As reported by CNN, low-income households and kids tend to be at higher risk of catching diseases like Asthma, because of exposure to pollen. With rising temperature, the situation is likely to get worst for allergies because plants like ragweed will start migrating. “Warmer temperatures allow the trees to pollinate earlier and for longer times. We didn’t used to see our cars covered in pollen before March, but we do now, and we hear from people all the time who are dealing with allergies for a lot longer than they used to when they were little. That’s definitely connected to,” CNN quoted Angel Waldron, as saying. “Hair works a bit like a mop, collecting pollen that’s floating in the air,” Waldron said. “Since hair is the closest thing to your nasal passages, it can really bother you. If you wash it or brush it out before you go to sleep, or at least cover it, then you won’t be sleeping in all that pollen.” Climate Change can also be controlled through simple amendments inside the home like - Turning out the lights while leaving the room, using energy-efficient light bulbs, unplug electronic appliances when not in use, do not use hot water for washing clothes and most important use public transport or carpool to reduce the number of trips you take in the car. All of these can help to control greenhouse gases emission in the environment. Make sure to carry good quality mask to prevent asthma & allergy. Vacuum cleaners with HEPA filters are helpful to improve indoor air quality. Also, make sure it has asthma & allergy friendly certification mark to make sure they will be your best defense against the yellow

stuff. The later readings are likely to be lower,” said Dr D Prabhakaran, researcher from Public Health Foundation of India (PHFI) and one of the authors of the study. “Since doctors are usually busy, the BP readings can be taken by a nurse,” he added. The data was analysed for over three months, revised in March and accepted for publication on April 1. Researchers from the PHFI, All India Institute of Medical Sciences, New Delhi, and the Economics and Planning Unit of the Indian Statistical Institute, collaborated to analyse the data. “Improper measurement of office BP can lead to inaccurate classification, overestimation of a patient’s true BP, unnecessary treatment, and misinterpretation of the true prevalence of hypertension,” the study said. The researchers believe the findings will benefit both patients as well as the health care system.

Eggs for breakfast benefit those with Type 2 diabetes

April 15, 2019/Hindustan Times

People with Type 2 Diabetes (TED) should opt for eggs for breakfast, a recent study suggests. According to the findings, a high-fat, low-carb breakfast (LCBF) can help those with T2D control blood sugar levels throughout the day. “The large blood sugar spike that follows breakfast is due to the combination of pronounced insulin resistance in the morning in people with T2D and because typical Western breakfast foods - cereal, oatmeal, toast and fruit - are high in carbohydrates,” said Jonathan Little, lead author of the study published in the Journal of the American Journal of Clinical Nutrition. According to Little, breakfast is consistently the “problem” meal that leads to the largest blood sugar spikes for people with T2D. The research shows that eating a low-carb and high-fat meal first thing in the morning, is a simple way to prevent this large spike, improve glycemic control throughout the day, and can perhaps also reduce other diabetes complications. “The results of our study suggest potential benefits of altering macronutrient distribution throughout the day so that carbohydrates are restricted at breakfast with a balanced lunch and dinner rather than consuming an even distribution and moderate amount of carbohydrates throughout the day,” Little asserted. As another interesting aspect of the research, participants noted that pre-meal hunger and their cravings for sweet foods later in the day tended to be lower if they ate the low-carb breakfast. Little suggests this change in diet may be a healthy step for anybody, even those who are not living with diabetes.

Inhalable chemotherapy may help treat lung cancer

April 15, 2019/Indian Express

Scientists are testing a targeted chemotherapy for lung cancer patients, that can be inhaled instead of being injected or taken orally. According to pharmaceutical scientist Nazrul Islam, from Queensland University of Technology (QUT) in Australia, lung cancer is one of the deadliest and most common cancers. “Drug delivery directly into the lungs via an inhaler is an efficient way to achieve local and systemic effects of medications,” Islam said. “My research is concerned with dry powder inhalation using chitosan nanoparticles loaded with drugs that can reach the lower respiratory tract and from there diffuse into the bloodstream,” he said. Islam said much research suggested chitosan-based nanoparticle drug delivery could be the way of the future to deliver drugs for many different

conditions besides lung cancer. “We need more research to understand the real-life degradation of chitosan, and identify degradation products and their possible toxicities in the body before we can conduct human trials,” he said. “Targeted delivery of drugs increases the target tissues’ exposure to the drug while reducing exposure of healthy cells and organs to that drug, which means less toxicity and fewer side-effects,” he added.



Global measles cases up 300 per cent year-on-year: WHO

April 16, 2019/Indian Express

Measles cases rose 300 percent worldwide through the first three months of 2019 compared to the same period last year, the UN said Monday, as concern grows over the impact of anti-vaccination stigma. Measles, which is highly contagious, can be entirely prevented through a two-dose vaccine, but the World Health Organisation (WHO) has in recent months sounded the alarm over slipping global vaccination rates. “Preliminary global data shows that reported cases rose by 300 per cent in the first three months of 2019, compared to the same period in 2018. This follows consecutive increases over the past two years,” it said in a statement. “While this data is provisional and not yet complete, it indicates a clear trend. Many countries are in the midst of sizeable measles outbreaks, with all regions of the world experiencing sustained rises in cases,” WHO further said. So far this year, 170 countries have reported 112,163 measles cases to WHO. At this time last year, 163 countries had reported 28,124 cases. “Spikes in case numbers have also occurred in countries with high overall vaccination coverage, including the United States,” WHO said. “The disease has spread fast among clusters of unvaccinated people,” it added. New York’s mayor declared a public health emergency in parts of Brooklyn last week, after a measles outbreak emerged in an ultra-Orthodox Jewish community, where some had resisted vaccination on religious grounds. WHO said the most dramatic rise in cases – a 700-per cent increase compared to last year – has been reported in Africa, which has weaker vaccination coverage than other regions.

Body mass index (BMI) plays significant role in progression of multiple sclerosis: Study

April 16, 2019/Hindustan Times

A recent study has identified a link between high levels of blood lipids and worsening of disease in multiple sclerosis (MS) patients who are overweight or obese. Following an extensive longitudinal investigation, conducted by the research team as part of this study, the researchers found that individuals who were overweight or obese had higher levels of blood lipids called ceramides, which placed markers on the DNA of monocytes, making them proliferate. Monocytes are blood cells that can travel to the brain and damage nerve fibres, and two years into their diagnosis, study participants with higher levels of ceramides and monocytes also had greater loss of motor skills and more brain injury. “Our study identifies important correlations between ceramide levels, body mass index, and disease progression in MS patients,” said Patrizia Casaccia, lead author of the study. As part of the study, researchers found that overweight and obese individuals with MS have higher ceramide levels than people with the disease who are not overweight and also those individuals who are overweight or obese but otherwise in healthy conditions. “This study gives us a much-needed view into the environmental influences that can affect and change the behaviour of cells in an individual’s body.

Our findings suggest that increased levels of saturated fat as a result of dietary habits are one likely cause of the epigenetic changes that advance MS, which gives us a starting point for potential intervention,” explained Kamilah Castro, first author of the study published in the Journal of EBioMedicine. The researchers’ findings support the concept of nutri-epigenomics (the ability of food to modify the way genomic information is interpreted by each cell) and the idea that lifestyle factors such as diet and weight can function as disease modifiers. Additional studies on larger cohorts are needed to validate the current findings. According to the researchers, further investigation is also needed to determine whether specific dietary interventions and weight management could be useful in helping MS patients manage and slow the progression of their disease and better respond to disease-modifying treatments.

‘Zinc deficiency rising in Indians’

April 17, 2019/The Hindu

Rising carbon dioxide levels can accelerate zinc deficiency in crops and thus in human consumption, cautions a new study titled ‘Inadequate zinc intake in India: past, present and future’ by the Harvard T.H. Chan School of Public Health. The study states that inadequate zinc intake has been rising in India for decades, causing tens of millions of people to become newly deficient in it. The study added that the highest rate of inadequate zinc intake was concentrated mainly in the southern and northeastern States with rice-dominated diets: Kerala, Tamil Nadu, Andhra Pradesh, Manipur and Meghalaya. “Rising carbon dioxide levels in the coming decades could accelerate this trend. National grain fortification programmes, increased dietary diversity, bio-fortified crops, and reduced carbon dioxide emissions could all make a difference to slow or reverse the course,” the study noted. Inadequate zinc intake can have serious health consequences, particularly for young children, who are more susceptible to contracting malaria, diarrhoeal diseases and pneumonia, when suffering from zinc deficiency. The presence of zinc plays a critical role in human immune systems. “Rice is poor in [the presence of] zinc, causing higher rates of zinc inadequacy in diets that rely heavily upon it. Overall urban populations, and wealthier urban groups in particular, showed higher rates of inadequate intake as well, due to a higher proportion of nutrient-poor fats and sugars in the diet,” the study said.

World Haemophilia Day 2019: 80 percent haemophilia cases undiagnosed in India according to doctors

April 17, 2019/Hindustan Times

Despite improvement in the medical technologies for the treatment of haemophilia, healthexperts believe that nearly 80 per cent of Indians with the serious blood disorder are not diagnosed due to the absence of proper diagnostic facilities in the remote areas. India with nearly two lakh cases is estimated to have the second highest number of patients with haemophilia, a lifelong bleeding disorder that prevents blood from clotting, doctors said ahead of the World Haemophilia day on April 17. According to Haemophilia Foundation of India, the umbrella body for registration of the patient with the disorder, the cause of haemophilia is the inability of the body to produce the anti-haemophilic factor (AHF) in the required quantity. There is no known cure for this disorder. “Until the diagnostic net is expanded neither haemophilia nor gravity of the problem can be known,” Kashyap told PTI. Stating the tests for diagnosing Haemophilia are not

expensive and can be done at district hospitals, Kashyap explained that there are two types of tests -- Activated Partial Thromboplastin Time (APTT) Test and Prothrombin Time (PT) Test. “The PT and APTT screenings are blood tests that show if the blood is clotting properly. Currently the only challenge is about screening which has a huge gap in the rural parts of India,” he said. Radhakrishnan said that treatment of haemophilia has undergone a lot of change in the last one decade. “Earlier there was a situation when the patient went without medicines and would go for physiotherapy and other treatments as remedies. “Today, though every state has been doing well in terms of ensuring treatment for the patients with haemophilia the major challenge remains diagnosis,” Radhakrishnan said.

Genetic metabolic disorder linked with DNA mutation, claims study

April 17, 2019/Hindustan Times

Researchers have identified that genetic metabolic disorder is linked with DNA mutation. According to the research published in New England Journal of Medicine, inherited metabolic disorders- in which the body can't break down specific nutrients from food leading to a range of serious health problems- are often caused by a defective gene. In the study by BC Children's Hospital, the University of British Columbia (UBC) and an international team of researchers, researchers found an unusual genetic mutation behind three children's undiagnosed, degenerative conditions: a repeat expansion of DNA. In this specific mutation, the gene appears undamaged but does not function because the DNA adjacent to it has extended several hundred times its normal length. “These findings were made possible by a multidisciplinary approach and advances in technology, techniques and software. It wouldn't have been possible as recently as two years ago and, most importantly, it shows us what to look for in other undiagnosed cases,” said Richmond. The gene identified as the cause of this particular disorder is an enzyme that enables the body to turn an amino acid called glutamine into glutamate. More work is needed to determine how exactly this genetic error leads to disease, but it's likely that either a build-up of glutamine or the lack of glutamate caused the children's serious developmental delays and disabilities including difficulty with language, speech, balance and coordination.

Senior's weakness for scams may be warning sign of dementia

April 18, 2019/Hindustan Times

Does an older friend or relative have a hard time hanging up on telemarketers? Or get excited about a “You've won a prize” voicemail? New research suggests seniors who aren't on guard against scams also might be at risk for eventually developing Alzheimer's disease. Elder fraud is a huge problem, and Monday's study doesn't mean that people who fall prey to a con artist have some sort of dementia brewing. But scientists know that long before the memory problems of Alzheimer's become obvious, people experience more subtle changes in their thinking and judgment. Neuropsychologist Patricia Boyle of Rush University's Alzheimer's disease center wondered if one of the warning signs might be the type of judgment missteps that can leave someone susceptible to scams. “When a con artist approaches an older person, they're looking for a social vulnerability — someone who is open to having a conversation with a complete stranger,” said Boyle. Then the older person must interpret that stranger's intentions and emotions, with little else to go on, in deciding whether to believe what they're peddling, she explained. Boyle turned to

data from the Financial Industry Regulatory Authority, which operates a fraud “risk meter,” to determine behaviors that could signal scam vulnerability — things such as answering the phone when you don’t recognize the number, listening to telemarketers, finding it difficult to end unsolicited calls, being open to potentially risky investments and not realizing that seniors often face financial exploitation.

New AI system may help detect prostate cancer

April 18, 2019/The Tribune

Researchers have developed a new artificial intelligence (AI) system to help radiologists improve their ability to diagnose prostate cancer.

The system, called FocalNet, helps identify and predict the aggressiveness of the disease evaluating magnetic resonance imaging, or MRI, scans.

It does so with nearly the same level of accuracy as experienced radiologists, said researchers at the University of California, Los Angeles (UCLA) in the US.

In tests, FocalNet was 80.5 per cent accurate in reading MRIs, while radiologists with at least 10 years of experience were 83.9 percent accurate, according to the study published in the journal IEEE Transactions on Medical Imaging.

Radiologists use MRI to detect and assess the aggressiveness of malignant prostate tumours.

However, it typically takes practicing on thousands of scans to learn how to accurately determine whether a tumour is cancerous or benign and to accurately estimate the grade of the cancer.

No breakfast and late dinner may up heart attack risk: Study

April 19, 2019/Hindustan Times

People who skip breakfast and eat dinner near bedtime may have worse outcomes after a heart attack, a study has warned. The study found that people with the two eating habits had a four to five times higher likelihood of death, another heart attack, or angina (chest pain) within 30 days after hospital discharge for heart attack. The study, published in the European Journal of Preventive Cardiology, is the first to evaluate these unhealthy behaviours in patients with acute coronary syndromes. Skipping breakfast was observed in 58 per cent, late-night dinner eating in 51 per cent, and both behaviours in 41 per cent. The study enrolled patients with a particularly serious form of heart attack called ST-segment elevation myocardial infarction (STEMI). “One in ten patients with STEMI dies within a year, and nutrition is a relatively inexpensive and easy way to improve prognosis,” said Marcos Minicucci, of Sao Paulo State University, Brazil.

Minicucci recommended a minimum two hour interval between dinner and bedtime. “A good breakfast is usually composed of dairy products, a carbohydrate, and whole fruits,” he said in a statement. Previous studies have found that people who miss breakfast and have a late dinner are more likely to have other unhealthy habits such as smoking and low levels of physical activity. “Our research shows that the two eating behaviours are independently linked with poorer outcomes after a heart attack, but having a cluster of bad habits will only make things worse,” said Minicucci. “People who work late may be particularly susceptible to having a late supper and then not being hungry in the morning,” Minicucci said.

“We also think that the inflammatory response, oxidative stress, and endothelial function could be involved in the association between unhealthy eating behaviours and cardiovascular outcomes,” he added.

World Liver Day 2019: Symptoms of liver disease and ways to keep it healthy



April 19, 2019/Indian Express

The liver, which measures about 1,00 grams in weight and 15 cm in length, is responsible for the synthesis of various proteins, coagulation factors, cholesterol, triglycerides and bile including glycogenesis. It is also responsible for detoxifications of drugs, alcohol and control of infections. Located in the upper right part of the abdomen separated from chest cavity by the diaphragm, it is one of the most vital organs in the body.

However, the graph of liver disease in India has grown over the decade and the dynamics has changed drastically, says Dr (Prof) Gourdas Choudhuri, executive director, Department of Gastroenterology and Hepatobiliary Sciences, Fortis Memorial Research Institute.

“Earlier liver diseases were synonyms with Hepatitis B and C only, but today we see lot of cases of liver failure, fatty liver, and every year about 10 lakh people with new liver disease are diagnosed in our country,” he says.

On World Liver Day, which is observed every year on April 19 to create awareness and understand the importance of the liver, he lists a few liver diseases and also shares tips on how to take care of the organ:

You must visit a doctor in case you have the following symptoms:

1. Unexplained abdominal pain and swelling which is continuous in nature.
2. Itchy and red skin around the stomach. Regular red patches around the stomach and skin are primary indication of something being wrong inside.
3. Dark urine is another early sign of liver disease. No matter how hydrated you are, if your urine is dark in colour you must visit a doctor.
4. Loss of appetite.
5. Blood in stool, or pale or tar-coloured stool.
6. Swelling in legs and ankles.
7. Nausea or vomiting.

Tips for liver care:

1. Adopt a healthy lifestyle and have a balanced diet.
2. Eat foods from all the food groups: grains, proteins, dairy products, fruits, vegetables and fats. Include green leafy vegetables, broccoli, cauliflower, cabbage, carrot, apple and walnut in your diet.
3. Eat foods that have lot of fibre such as fresh fruits and vegetables, whole grain breads, rice and cereals such as quinoa, millet and buckwheat.
4. Ensure safe blood transfusions to avoid contracting hepatitis A, B, C.
5. Maintain personal hygiene and be sure to wash hands after using the washroom.
6. Avoid tap water when travelling.
7. Say no to alcohol, tobacco and drugs.
8. Exercise regularly.

With regards,

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