COVID-19 mRNA vaccines are safe in pregnancy, large study confirms

STAR HEALTH DESK

COVID-19 mRNA vaccines are safe to use during pregnancy, and pregnant women had lower rates of health events after vaccination than similarly aged non-pregnant vaccinated people, a large Canadian study found.

Researchers found that 4.0% (226/5,597) of mRNA-vaccinated pregnant females reported a significant health event within seven days after dose one and 7.3%

(227/3,108) after dose two. After dose two, pregnant women most commonly reported feeling unwell, headache/migraine, and respiratory tract infection. 3.2% (11/339) of unvaccinated pregnant women reported similar events the week before the survey. In the vaccinated non-pregnant control group, 6.3% reported a significant health event after dose one and 11.3% after dose two.

After doses one and two, serious health events were rare in all groups (less than 1%) and occurred at similar rates in vaccinated pregnant people, vaccinated non-pregnant people, and unvaccinated controls. Miscarriage/stillbirth was the most commonly reported adverse pregnancy outcome with no significant difference between vaccinated and unvaccinated women; 2.1% (7/339) of unvaccinated pregnant women and 1.5% (83/5,597) of vaccinated pregnant women experienced a miscarriage or stillbirth within seven days after dose one of any mRNA vaccine.

Source: *The Lancet Infectious Diseases*

Thalassaemia in Bangladesh: Prevention strategy

PROF WAQAR A KHAN

Thalassemia is Bangladesh's most common congenital disability. Our country has 17 million thalassemia carriers and 14,000 new cases each year. Thalassaemia causes low haemoglobin. It is not contagious and cannot be spread by direct contact. When both parents are carriers, it is passed to their children.

Most carriers are normal, and mildly anaemic ones are diagnosed with iron deficiency. Mildly anaemic carriers are given iron supplements but do not raise haemoglobin and can harm them. These subjects' anaemia must be diagnosed. Clinically, carriers cannot be detected; a Haemoglobin Electrophoresis (HbE) test is required. Hb electrophoresis helps determine carrier status. A healthy couple may give birth to a thalassaemic child with lifelong illness and financial and mental strain. Thalassemia has two types. Our country has thalassemia major and Hb E beta.

As treatment is expensive and lifelong, most patients cannot afford it and develop complications and die young. Depending on age, frequency of transfusions, and dosage, it costs Tk 5,000 to 10,000 per month. Our country has 140,000 thalassemia patients. No patient registry exists. These patients need expensive treatment. Every year, many thalassemic are born. Preventing thalassemia births is best.

Awareness of the disease, carrier detection, prenatal diagnosis, and abortion of affected fetuses have successfully prevented thalassemia births in Cyprus, Greece, and Iran.

Prenatal diagnosis determines if a fetus has thalassaemia 10 to 15 weeks before birth if both parents are carriers.

The government must create prenatal diagnosis facilities, disease awareness, and carrier detection. Each division should set up DNA labs and train gynaecologists to collect prenatal samples and molecular

biologists or biochemists to analyse DNA. Prenatal diagnosis is done in only two places. One at Dhaka Shishu Hospital, another privately. There are 17 million carriers and many young people of marriageable age. Two DNA labs in Dhaka will help a fraction of these carriers.

There are two methods for the collection of samples from the fetus of the mother, and the sample collected is sent for DNA analysis.

1. Chorionic villus sampling
2. Amniocentesis

Chorionic villus sampling (CVS) is a small sample of the developing placenta's genetic material. The placenta tissue is obtained using an ultrasound-guided needle inserted through the abdominal wall. The chorionic villi are aspirated. This technique can be used after 11 weeks. CVS is preferred because it is done in the first trimester of pregnancy within many countries' abortion laws. It reduces the emotional stress of late-pregnancy complications.

Amniocentesis is amniotic fluid analysis. This is done after 15 weeks. The procedure involves aspirating 15-20 ml of amniotic fluid through the abdomen under ultrasound guidance. This method's procedure and diagnosis are late. The mother's abortion is traumatic. DNA analysis determines if the fetus is affected, a carrier, or normal. If the fetus is affected, the parents can abort or continue the pregnancy.

Dhaka Shishu Hospital Thalassaemia Centre recently opened a DNA lab to analyse chorionic villus and amniotic fluid samples to detect fetuses whose parents are thalassemia carriers or have a previously affected child. This will help to detect the thalassemia cases.

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HAVE A NICE DAY

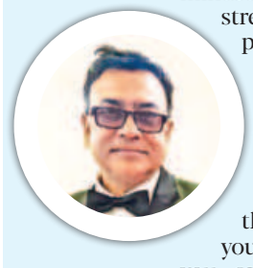
Mindset matters

DR RUBAIUL MURSHED

Success requires a positive mindset. True success brings mental and physical health, natural achievements, and happiness. A growth mindset is more important than money, hard work, and effort.

Our society changes our mindsets by teaching us what is right and wrong. Each moment, our brain triggers a health-related thought or feeling. Stanford psychiatrists studied how changing mindset can improve health, reduce stress, and help us overcome life's challenges.

Adopting a stress-enhancing mindset leads to optimal physiological stress responses, with moderate cortisol and high DHEA (growth hormone) levels. Self-reinforcing stress beliefs By changing our mindset, we can reduce stress and improve our physical and mental health. Researchers say, mindsets affect happiness and good deeds. Good deeds make one kind. Some believe that "no matter where you are in life or where you came from, you can set goals and achieve them," but most of us see life through our unique lenses or mindsets based on traditions and expectations about ourselves and the world around us.



Social media influences people's mood, mindset, and health and well-being like friends and family. They lack community or ethical standards.

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Stress may be reflected in your hair's cortisol levels

STAR HEALTH REPORT

Hair cortisol concentration (HCC) represents a potential biomarker of chronic psychological stress. Previous studies exploring the association between perceived stress and HCC have been limited to relatively small and selected populations.

A study was conducted on the hair samples from 881 women from the Mexican Teachers' Cohort (MTC) and 398 women from the Icelandic SAGA pilot cohort. MTC participants had slightly higher HCC and PSS scores than SAGA participants. After adjusting for

sociodemographic factors and health behaviours, researchers observed a 1.4% increase in HCC for each unit increase in the Perceived Stress Scale-10 (PSS-10) score in the combined sample.

Furthermore, PSS-10 quintiles were associated with a 24.3% increase in HCC when comparing the highest to the lowest quintile after multivariable adjustment. Similar results were obtained when each cohort was analysed separately and using the PSS-4.

Despite relatively small absolute differences, an association between perceived stress and HCC was found in a sample of women from two diverse geographical and cultural backgrounds supporting the hypothesis that HCC is a viable biomarker in studies of chronic psychological stress.

Source: *PLOS Global Public Health*

New antibiotic resistance genes identified in tuberculosis

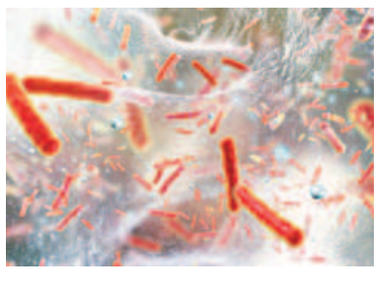
STAR HEALTH REPORT

An international consortium analysed the genetic sequences and antibiotic susceptibility of more than 10,000 global *Mycobacterium tuberculosis* isolates.

A massive analysis of more than 10,000 different Mycobacterium tuberculosis bacteria isolates from 23 countries has revealed new genes associated with resistance to 13 first- and second-line new and repurposed antibiotics. The work, carried out by Comprehensive Resistance Prediction for Tuberculosis: an International Consortium (CRyPTIC), is described in two new papers publishing recently in the open-access journal PLOS Biology.

Tuberculosis (TB) is a curable and preventable disease; 85% of those affected can be successfully treated with a six-month regimen of drugs. Despite this, TB has killed more people than other infectious diseases in recent years, and drug-resistant TB is a continual threat. A better understanding of the *M. tuberculosis* variants confers antibiotic resistance is important for better monitoring resistant strains and developing new drugs.

The first new paper outlined how they assembled an open-access data compendium of 12,289 *M. tuberculosis* isolates, processed in CRyPTIC partner laboratories worldwide. Each isolate was sequenced and then tested on a high-throughput grid with varying concentrations of 13 antimicrobials. Of the samples included in the compendium, 6,814 were resistant to at least one drug, including 4,685



samples resistant to multiple drugs or the first-line treatment of rifampicin.

The consortium presented their findings from a genome-wide association study (GWAS) in the second paper using the data on 10,228 *M. tuberculosis* isolates. For all 13 drugs, the group discovered uncatalogued variants associated with significant increases in the minimum inhibitory concentration – the lowest concentration of an antibiotic that stops the growth of *M. tuberculosis*. Analysing this concentration, rather than a binary resistant-or-not-resistant result, allowed the identification of variants that cause only subtle changes to the antibiotic response that may be overcome by increasing the drug dose. The researchers selected the 20 most significant genes that confer resistance to each drug and described the effect size and variations within these specific genes in more depth.

"The compendium is not designed for measuring prevalence or estimating 'real-world' error rates of resistance prediction tools; rather, it serves as a resource to accelerate antimicrobial resistance diagnostic development by enriching mutation catalogues for [whole genome sequencing] resistance prediction, improving our understanding of the genetic mechanisms of resistance, and identifying important diagnostic gaps and drug resistance patterns," the authors say. "The data compendium is fully open-source, and it is hoped that it will facilitate and inspire future research for years to come."

Source: *PLOS Biology*