

TESTOSTERONE A SIGNIFICANT BOOST FOR WOMEN ATHLETES

PARIS: Women runners born with high testosterone levels enjoy a "significant competitive advantage", said a study yesterday that could reignite debate on the future participation of athletes whose gender was questioned. The study, jointly sponsored by the sporting agency seeking to ban athletes with hyperandrogenism, comes three weeks before the International Association of Athletics Federations (IAAF) must present expert evidence on "the actual degree" of advantage women could gain.

Hyperandrogenism is a condition that causes high natural levels of the male hormone, testosterone, in women. Without proof, IAAF regulations excluding women with hyperandrogenism from competition are set to lapse. Track stars such as South Africa's Caster Semenya and India's Dutee Chand both endured banishment for failing so-called "gender tests". The new study, published in the British Journal of Sports Medicine, was funded by the IAAF and the World Anti-Doping Agency (WADA).

One of the authors, Stephane Bermon, is an IAAF consultant and a member of its working group on hyperandrogenic athletes. The other, Pierre-Yves Garnier, is director of the IAAF's health and science department. He returned to work in January after a three-month suspension in a probe linked to Russian athletics doping. Their research relied on blood data from male and female athletes who competed in the World Championships in 2011 and 2013 — more than 2,100 samples in all.

It found that women with high natural testosterone levels performed better in the 400-metre sprint, 400 m hurdles, and 800 m middle-distance events than women with low levels. They also outperformed them at pole-vaulting and hammer throw. Depending on the event, performance improved by between 1.8 and 4.5 percent, the paper said.

This link, concluded the authors, "should be taken into account when the eligibility of women with hyperandrogenism to compete in the female category of competition is discussed." The study is an observational study that cannot determine conclusively that higher testosterone is what causes the performance boost, merely that an increase in one is associated with an increase in the other.

Unfair or discriminatory?

Testosterone, which can also be injected as a performance-enhancer, increases muscle mass and boosts physical strength. The issue of hyperandrogenism is controversial because it has pitted principles of fair competition against the rights of women born with a condition they have no control over. In 2011, the

IAAF introduced so-called "hyperandrogenism regulations" after a highly-emotive and public battle with South Africa's Semenya.

The regulations allowed hyperandrogenic athletes to take medication to lower their testosterone levels to below 10 nanomoles per liter—considered a low level in men. The natural range for women is about 10 times lower. Semenya won gold in the 800 m at the 2009 World Championships in Berlin, but was subsequently barred from competing for nearly a year while undergoing gender tests. Competitors say hyperandrogenic athletes enjoy an unfair physical advantage, but critics say gender testing is arbitrary, discriminatory and psychologically harmful.

In 2015, the Court of Arbitration for Sport (CAS) suspended the IAAF regulations in a challenge brought on behalf of India's Chand, a sprinter. It said there was not sufficient scientific evidence that natural testosterone boosts performance in hyperandrogenic women, and gave the agency two years to submit expert reports to the contrary.

The deadline of July 27 is fast approaching. "Our starting position is to defend, protect and promote fair female competition," an IAAF statement quoted Bermon as saying yesterday. "This study is one part of the evidence the IAAF will be submitting to the CAS," he added. There would be no impact on the World Championships in London in August, as the regulations remain suspended "pending the resolution of the CAS proceeding", the association said.—AFP



NEW DELHI: This file photo shows Dutee Chand of Odisha taking part in the 100 meter race during 20th Federation Cup National Senior Athletics Championship in New Delhi. —AFP

CHINA ROCKET FAILURE LIKELY TO SET BACK NEXT SPACE MISSIONS

BEIJING: The failure of China's Long March 5 rocket deals a rare setback to China's highly successful space program that could delay plans to bring back moon samples and offer rival India a chance to move ahead in the space rankings. Experts say the still unexplained mishap shows that for all its triumphs, China's space program is not immune to the tremendous difficulties and risks involved in working with such cutting-edge technology.

"China's approach has been slow and prudent, trying to avoid this kind of 'failure,' even though they knew it was going to occur sooner or later," Joan Johnson-Freese, an expert on China's space program at the US Naval War College, wrote in an email. Authorities say the Long March 5 Y2 that took off Sunday in the second launch of a Long March 5 rocket, suffered an abnormality during the flight after what appeared to be a successful liftoff from the Wenchang Space Launch Center in the southern island province of Hainan.

The incident is under investigation and the authorities have yet to comment on possible causes, or any knock-on effects on the program as a whole. In a testimony to the high respect China's program now commands, the failure drew widespread commentary in the space community, including from SpaceX founder and chief executive Elon Musk, who tweeted Sunday: "Sorry to hear about China launch failure today. I know how painful that is to the people who designed & built it."

Nicknamed "Chubby 5" for its massive, 5-meter girth, the Long March-5 is China's largest and most brawny launch vehicle, capable of carrying 25 tons of payload into low-earth orbit and 14 tons to the more distant geostationary transfer orbit in which a satellite orbits constantly above a fixed position on the earth's surface. That's more than double that of the Long March 7, the backbone of the Chinese launching fleet, making it the linchpin for launch duties requiring such massive heft such as interplanetary travel.

First among those is the mission slated for November by the Chang'e 5 probe to land a rover on the moon before returning to Earth with samples - the first time that has been done since 1976. China's most technically demanding mission to date, it had been put off before because of funding and then technology, Johnson-Freese said. While the Long March 5 has suffered other setbacks, the lunar mission is "certainly the most visible one," she said.

Finding a fix

Other upcoming Chinese missions include the launch next year of the 20-ton core module for China's orbiting Tiangong 2 space station, along with specialized components for the 60-ton station that is due to come on-line in 2022 and other massive payloads in future. The Long March 5 was also due to be the launch vehicle for a Mars rover planned for the mid 2020s. Problems with the Long March 5 may stem from



BEIJING: In this photo, a girl stands in front of models of Chinese space rockets, including the Long March 5, second from left, at the China Beijing International High-Tech Expo in Beijing. —AP

its use of liquefied gases that are less stable than the solid propellants used in other rockets, said Morris Jones, an Australian space analyst and regular contributor to SpaceDaily.com.

Unlike earlier rockets that used highly toxic fuels, the Long March 5 burns a more environmentally friendly and less expensive kerosene-liquid oxygen-liquid hydrogen mix - which is more complex and harder to regulate. Jones called such setbacks typical of the development phase of a new rocket and said additional launches may be required to work out the kinks. Sunday's launch failure will delay the Chang'e 5 mission at least until next year, while there may also be a small delay in launching the space station components, Jones said.

Finding a fix "takes a lot of time and effort but there is no other way to produce a reliable rocket," Jones said. Test launched for the first time last year in what had been a towering success, the 57-meter two-stage rocket is just slightly less powerful than the most powerful rocket in service, the US' United Launch Alliance's Delta IV, although SpaceX's Falcon Heavy is designed to carry a payload into low-earth orbit of more than 50 tons. Since the first launch in 1970, China's Long March series of rockets have been a remarkably solid bet, achieving a success rate of around 95 percent.

That's helped facilitate a program that conducted its first crewed space mission in 2003, making China only the third country after Russia and the US to do so, put a pair of space stations into orbit, and landed its Yutu, or "Jade Rabbit"

rover on the moon. Administrators suggest a manned landing on the moon may also be in the program's future. Not all has been smooth sailing, however. A Long March 3B rocket launched June 18 launch placed its communications satellite in a lower-than-planned orbit. Though the satellite is climbing into its proper altitude on its own, the effort will reduce its useful lifespan in space.

A least two similar incidents reportedly occurred last year. With two mishaps coming so close together, Chinese space officials may decide to take a pause to re-evaluate manufacturing quality or other aspects of the program, said Stephen Clark of Spaceflight Now. That may include launching another Long March 5 test flight before attempting the Chang'e 5 mission, Clark said. Both Clark and Johnson-Freese said they hope the failure doesn't deter Chinese officials in their pursuit of greater transparency and international participation in the country's space program.

Yet, rivals, primarily India, may see the setback as an opportunity to steal a march on China, whose geostrategic influence has benefited significantly from its role as a technology leader in space, said Johnson-Freese. India's Mars Orbiter Mission, called Mangalyaan, is already orbiting the red planet, years before China is ready to launch such a mission, and it won acclaim and a place in the record books earlier this year by placing 104 nano satellites in orbit from a single rocket. "The failure of the Long March 5 may provide a window of opportunity for India," said Johnson-Freese.—AP

LUNAR ROBOTS PUT TO THE TEST ON SICILY'S MOUNT ETNA

MOUNT ETNA, Italy: A robot wheels across a rocky, windswept landscape that looks like the surface of some distant planet from a science fiction film. But it is not in outer space, it's on the slopes of Europe's most active volcano. Mount Etna, in Sicily, is a test bed for the approximately three-foot high, four-wheeled machine ahead of a future mission to the moon. It is being conducted by the German Aerospace Centre, the agency which runs Germany's space program.

The program has enlisted experts from Germany, Britain, the United States

and Italy to research ROBEX (Robotic Exploration of Extreme Environments) with the aim of improving robotic equipment that will be used in space. "This is aimed at stimulating a future, hypothetical landing mission on the moon or Mars and they use a lot of robots which are there to transport and install different instruments", said Boris Behncke, a volcanologist from the National Vulcanology Institute in Catania, near Mount Etna. Scientists also hope to use the robots to explore the depths of Mount Etna and relay back useful technical data on seismic movement.—Reuters

TSUNAMI OF TOXIC WASTEWATER KILLS PLANTS, ANIMALS IN ISRAEL'S DESERT

MISHOR ROTEM, Israel: Toxic wastewater that surged through a dry riverbed in southern Israel at the weekend left a wake of ecological destruction more than 20 km long. The flood began last Friday when the 60 meter high wall of a reservoir at a phosphate factory partially collapsed, letting loose 100,000 cubic meters of highly acidic wastewater in the Ashalim riverbed. That was enough fluid to fill 40 Olympic-sized pools.

The toxic torrent snaked through the desert, singeing anything in its path, before collecting

again hours later in a pool several kilometers from the Dead Sea, the lowest point on earth. Days later, the ground is still stained a dark brown and giving off a nauseating acidic stench, more potent than a highly chlorinated swimming pool. One section of the Ashalim riverbed is made up of narrow canyons, popular for hiking, but no one was around when the wastewater first gushed through.

Israel's Ministry of Environment has opened a criminal investigation into the plant's owner, Rotem Amfert, and its parent company Israel Chemicals (ICL), a leading

potash and fertilizer producer with exclusive rights in Israel to mine the Dead Sea. "All the plants and animals in the valley during the tsunami of acid were probably highly damaged, probably dead," said Oded Netzer, an ecologist for the ministry. "In the long term, there will be soil damage and large functional ecological problems."

He said weeks of intense clean-up work, including pumping out small pools of the wastewater that remain along the path, lay ahead, and complete rehabilitation would likely take years. ICL has stopped using the series of

reservoirs where the breach occurred. They contained a production by-product called phosphogypsum water.

The company declined to answer questions on the criminal investigation or about the impact the incident will have on its operations. Shares in ICL fell almost 4 percent after the spill but partially recovered to trade 1.3 percent higher on Tuesday. In a statement, Rotem Amfert said it was working "around the clock" in full coordination with authorities, and it would spare no resources to clean up the riverbed.—Reuters

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Kuwait Times
248 33 199





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