Alzheimer's treatment

US experts to review Biogen drug that could be first new Alzheimer's treatment in decades
Drugmaker estimates about 1.5 million people with early Alzheimer’s in the US can be candidates for the drug (The Tribune: 20201104)


US experts to review Biogen drug that could be first new Alzheimer's treatment in decades
A sign marks a Biogen facility in Cambridge, Massachusetts. Reuters File

US health experts this week will decide whether to recommend approval for Biogen Inc's Alzheimer's drug, which could become the first new treatment for the mind-wasting disease in decades even as serious questions persist over whether data show if it works.

In a field littered with unrelenting failure, Biogen believes in aducanumab it has the first drug that can treat an underlying cause, and therefore slow progression, of Alzheimer's. But its path to approval has been anything but smooth or assured.

Biogen abruptly ended clinical trials of aducanumab last year after an early look at trial results showed it was not effective. Last October, the company shocked many Alzheimer’s experts by reversing course, saying that a new analysis showed aducanumab could help patients with early-stage disease preserve their ability to function independently for longer. In July, Biogen filed for approval from the Food and Drug Administration.

Now the agency faces tremendous pressure to approve a treatment option for millions of Americans suffering from Alzheimer's and the millions more expected to face it in coming years.

Patient advocates say the need for a new Alzheimer’s treatment that could help people remain independent is heightened by the coronavirus pandemic, which has killed more than 229,000 people in the United States, including tens of thousands of seniors in nursing homes.
"The pandemic came and it changed everything," said Russ Paulsen, chief operating officer at patient advocacy group UsAgainstAlzheimer's. "We need something to keep people out of nursing homes."

A committee of outside advisers to the FDA will discuss aducanumab on November 6. The agency's final decision is expected by March. European health regulators have also accepted the drug for review.

Charles Flagg, a 79-year-old retired minister from Jamestown, Rhode Island, had been enrolled for years in a trial of aducanumab before it was stopped. He started receiving the drug again in August as part of a follow-up study, according to his wife Cynthia Flagg.

“He’s not 100 per cent himself, but overall I’m not dealing with someone that needs to be led around or be in a care home,” said Flagg.

Aducanumab, an antibody designed to remove amyloid plaques from the brain - a strategy tried with many failed Alzheimer's drugs - would reap billions of dollars in sales if approved.

Biogen, along with partner Eisai Co Ltd, is one of the last large drugmakers pursuing treatments for a disease that afflicts nearly 6 million Americans and millions more worldwide.

Biogen estimates about 1.5 million people with early Alzheimer’s in the United States could be candidates for the drug.

'Clinically meaningful'

Late last year, Biogen said one of its two pivotal studies of aducanumab showed a statistically significant benefit at slowing cognitive and functional decline in patients with early Alzheimer’s.

A second trial failed to achieve that goal, but did show a benefit for a subset of patients who were given a high dose for at least 10 months.

In March, it opened a follow-up long-term safety study to 2,400 people who had previously participated in trials of aducanumab, like Flagg.

Many Alzheimer's researchers say Biogen should conduct a third large study to prove aducanumab works. They worry about its possible side-effects, such as brain-swelling, and the potential cost.

"Aducanumab's efficacy as a treatment for the cognitive dysfunction in Alzheimer's disease cannot be proven by clinical trials with divergent outcomes," said Mayo Clinic neurologist Dr David Knopman, who was recused from the expert panel because he helped conduct the trials.

Others believe the FDA could approve the drug without another trial.

Previous clinical studies had largely targeted patients in later stages of the disease, while many experts now believe attacking Alzheimer's as early as possible may be the key to success. But there was a lack of clarity on how to assess a drug's success when functional deficits are less pronounced.
In 2018, the FDA revised its standard of proof guidance for reviewing Alzheimer’s drugs by essentially combining what had been separate goals for cognition, or memory, and day-to-day function. The new guidance stressed the need for a drug to show “clinically meaningful” benefits, a term it has not clearly defined.

Alzheimer's advocacy groups are pushing for a broad definition, saying it should include preserving the ability to perform daily activities such as shopping independently or remembering to turn off a stove.

“They have been trying to lower the bar and help any company to get a drug approved,” said Dr Marwan Sabbagh, from the Cleveland Clinic Lou Ruvo Center for Brain Health in Las Vegas.

COVID-19 spread

Hot or cold weather may have no significant effect on COVID-19 spread: Study
The study defined weather as ‘equivalent air temperature, which combines temperature and humidity into a single value (The Tribune: 20201104)


Hot or cold weather may have no significant effect on COVID-19 spread: Study
Photo for representation.

Temperature and humidity do not play a significant role in the spread of novel coronavirus, that causes COVID-19, according to a study led by an Indian-origin researcher in the US.

The study, published in the International Journal of Environmental Research and Public Health, suggests that the transmission of COVID-19 from one person to the next depends almost entirely on human behaviour, irrespective of hot or cold weather.

The researchers noted that weather influences the environment in which the coronavirus must survive before infecting a new host. However, it also influenced human behaviour, which moves the virus from one host to another, they said.

“The effect of weather is low and other features such as mobility have more impact than weather. In terms of relative importance, weather is one of the last parameters,” said Dev Niyogi, a professor at the University of Texas (UT) at Austin, US, who led the research.

The study defined weather as “equivalent air temperature”, which combines temperature and humidity into a single value.
The scientists then analysed how this value tracked with coronavirus spread in different areas from March to July 2020, with their scale ranging from the US states and counties, to countries, regions and the world at large.

At the county and state scale, the researchers also investigated the relationship between coronavirus infection and human behaviour, using cellphone data to study travel habits.

The study examined human behaviour in a general sense and did not attempt to connect it to how the weather may have influenced it.

At each scale, the researchers adjusted their analyses so that population differences did not skew results. Across scales, the scientists found that the weather had nearly no influence.

The researchers compared the weather with other factors using a statistical metric that breaks down the relative contribution of each factor towards a particular outcome.

They found that the weather’s relative importance at the county scale was less than 3 per cent, with no indication that a specific type of weather promoted spread over another.

In contrast, the data showed the clear influence of human behaviour — and the outsized influence of individual behaviours, according to the researchers.

Taking trips and spending time away from home were the top two contributing factors to COVID-19 growth, with a relative importance of about 34 per cent and 26 per cent respectively, they said.

The researchers noted that the next two important factors were population and urban density, with a relative importance of about 23 per cent and 13 per cent respectively.

“We shouldn’t think of the problem as something driven by weather and climate. We should take personal precautions and be aware of the factors in urban exposure,” said study co-author Sajad Jamshidi, a research assistant at Purdue University in the US.

Maryam Baniasad, a doctoral candidate at Ohio State University, US, said assumptions about how coronavirus would respond with weather were largely informed by studies conducted in laboratory settings on related viruses. Baniasad said this study illustrated the importance of studies that analyse how the coronavirus spread through human communities.

“When you study something in a lab, it’s a supervised environment. It’s hard to scale up to society. This was our first motivation to do a broader study,” she added. PTI
COVID-19 super-spreading events play ‘outsized role’ in disease transmission, say scientists

Based on their findings, the scientists developed a mathematical model of COVID-19 transmission, which they used to show that limiting gatherings to 10 or fewer people could significantly reduce the overall number of infections (The Tribune: 20201104)

COVID-19 super-spreading events play ‘outsized role’ in disease transmission, say scientists

COVID-19 super-spreading events, in which one person infected with the novel coronavirus transmits it to many other people, play an “outsized role” in the overall spread of the disease, according to a new study which says preventing large gatherings could significantly curb the pandemic.

The study published in journal PNAS assessed about 60 super-spreading events, revealing that events where one person infects more than six other people are much more common than would be expected if the transmission patterns followed statistical distributions commonly used in epidemiology.

Based on their findings, the scientists, including those from the Massachusetts Institute of Technology (MIT) in the US, developed a mathematical model of COVID-19 transmission, which they used to show that limiting gatherings to 10 or fewer people could significantly reduce the overall number of infections.

“Super-spreading events are likely more important than most of us had initially realised. Even though they are extreme events, they are probable and thus are likely occurring at a higher frequency than we thought,” said James Collins, senior author of the new study.

“If we can control the super-spreading events, we have a much greater chance of getting this pandemic under control,” Collins said.

For the novel coronavirus, the scientists said the “basic reproduction number” was around three, meaning that on average, each person infected with the virus spreads it to about three other people.
However, they said this number varies widely from person to person, with some who don’t spread the disease to anyone else, while “super-spreaders” infect dozens of individuals.

“We figured that an analysis that’s rooted in looking at super-spreading events and how they happened in the past can inform how we should propose strategies of dealing with, and better controlling, the outbreak,” said Felix Wong, another study co-author from MIT.

In the research, the scientists defined super-spreaders as individuals who passed the virus to more than six other people.

Using this definition, they identified 45 super-spreading events from the current COVID-19 pandemic and 15 additional instances from the 2002-03 SARS pandemic outbreak, all documented in scientific journal articles.

According to the researchers, during most of these events, between 10 and 55 people were infected but two of them, both from the 2003 outbreak, involved more than 100 people.

Typically, events in which the disease spreads to dozens of people would be considered very unlikely, they said.

However, the MIT team found that this was not the case for coronavirus super-spreading events.

The scientists found that even though super-spreading events were extreme, they were still likely to occur.

“This means that the probability of extreme events decays more slowly than one would have expected,” Wong said. “These really large super-spreading events, with between 10 and 100 people infected, are much more common than we had anticipated,” he added.

According to the researchers, many factors may contribute to making someone a super-spreader, including their viral load and other biological factors.

They did not address these factors in this study, but the scientists modelled the role of connectivity — defined as the number of people that an infected person comes into contact with.

In order to study the effects of connectivity, the scientists created and compared two mathematical network models of disease transmission.

In each, the average number of contacts per person was 10, but they designed one model to have an exponentially declining distribution of contacts, while in the other, some people had many contacts.

The researchers found that in the latter model, many more people became infected through super-spreader events.

However, the study noted that the transmission stopped when people with more than 10 contacts were taken out of the network and assumed to be unable to catch the virus.
Based on the results, the researchers said preventing super-spreading events could have a significant impact on the overall transmission of COVID-19.

“It gives us a handle as to how we could control the ongoing pandemic, which is by identifying strategies that target super-spreaders,” Wong said. “One way to do that would be to, for instance, prevent anyone from interacting with over 10 people at a large gathering,” he added.

**Depression, anxiety**

**Depression, anxiety are more frequently diagnosed in women: Study (New Kerala: 20201104)**


Women are more frequently diagnosed with depression and anxiety and the taking of prescribed psychotropic drugs is also significantly higher among them, suggests a new study.

Gender is a significant determining factor in mental health and in how it is managed by the healthcare services, according to recent studies conducted on the basis of health questionnaires completed in the Basque Autonomous Community (2018) and in Spain (2017), and on the Spanish sample corresponding to the European Health Survey (2014).

The UPV/EHU's research group OPIK, Social Determinants of Health and Demographic Change, is a multidisciplinary group comprising research personnel in the field of social and health sciences; it explores the social factors influencing health and disease in the population, social inequalities in health and the policies that have the potential to modify these social determinants in the interests of improving the health of the population.

What stands out in the analysis of these three databases is the higher prevalence of poor mental health among women of all ages and across all social groups; in addition, there is a multiplier effect due to the accumulation of experiences of inequality. This reality also appears to be unequal in terms of the age and socioeconomic level of the patients.

Amaia Bacigalupe, one of the authors of the study, asserts that "women are more frequently diagnosed with depression and anxiety and the taking of prescribed psychotropic drugs is also significantly higher, even if there is no difference with men with respect to mental health equality, diagnoses and frequency of visits to healthcare centres.

"All this could point to the existence of a medicalisation process of mental health in women, but interpreting its origin is complex since the processes involving the high prevalence of diagnosis and overprescription undoubtedly play a role, but maybe also due to infra-diagnosis and lower prescription rates in men".

Bacigalupe adds that these aspects should be tackled in greater depth in future studies.
Reducing gender inequalities

The research group highlights the fact that reducing gender inequalities in mental health will need to be the result of policy intervention on various levels. "There is a clear relationship between the degree of gender inequality in society and gender inequalities in mental health," says Amaia Bacigalupe.

"So all those policies designed to combat the discrimination endured by women on the labour market, in the responsibility for domestic and care work, in the use of time and, generally, relating to those that empower women on the basis of their greater political representation and making them more socially visible, will exert a positive effect on the reduction in mental inequalities between men and women".

Another aspect highlighted in the study is the need to make commitments starting from an institutional level and geared towards curbing the medicalisation of everyday malaise from a clear gender perspective. "In the field of mental health in which the medicalisation of malaise is especially common, far from addressing the cause of the problem, some problems of a social origin end up receiving psychiatric or psychological treatment," said the researcher in the Department of Sociology 2 at the UPV/EHU.

According to the study, it would also be necessary to encourage spaces for reflection in the clinical setting designed to help to collectively deconstruct certain aspects that have become natural in gender binarism and which have underpinned the definitions of psychopathology and its current treatment. Bacigalupe also says that "the actual incorporation into clinical practice of the biopsychosocial model, as well as the implementing of strategies to promote health and emotional well-being from a community health approach based on assets, could prevent the over-pathologization and over-medicalization of everyday malaise once a global view of how the social context influences health is acquired".

Influenza

Researchers have developed a new artificial intelligence (AI) powered forecasting tool which will predict influenza outbreaks very easily.(New Kerala: 20201104)


By incorporating location data, the AI system is able to outperform other state-of-the-art forecasting methods, delivering up to an 11 per cent increase in accuracy and predicting influenza outbreaks up to 15 weeks in advance.

"Past forecasting tools have sought to spot patterns by studying the way infection rates change over time but we used a graph neural network to encode flu infections as interconnected regional clusters," said study author Yue Ning from Stevens Institute of Technology in the US.
It allows their algorithm to tease out patterns in the way influenza infections flow from one region to another, and also to use patterns spotted in one region to inform its predictions in other locations.

"Capturing the interplay of space and time lets our mechanism identify hidden patterns and predict influenza outbreaks more accurately than ever before," said Ning.

"By enabling better resource allocation and public health planning, this tool will have a big impact on how we cope with influenza outbreaks," Ning added.

The research team trained their AI tool using real-world state and regional data from the US and Japan, then tested its forecasts against historical flu data.

Other models can use past data to forecast flu outbreaks a week or two in advance, but incorporating location data allows far more robust predictions over a period of several months.

"Our model is also extremely transparent -- where other AI forecasts use 'black box' algorithms, we're able to explain why our system has made specific predictions, and how it thinks outbreaks in different locations are impacting one another," Ning explained.

So far, the AI tool hasn't been used in real-world health planning, but Ning said that it's just a matter of time until hospitals and policymakers begin using A.I. algorithms to deliver more robust responses to flu outbreaks.

"Our algorithm will keep learning and improving as we collect new data, allowing us to deliver even more accurate long-term predictions," Ning said.

Their study was presented at the 29th ACM International Conference on Information and Knowledge Management.

Ayurveda 'remarkable'

Ayurveda 'remarkable' for improving sleep disorder: AYUSH. (New Kerala: 20201104)


If you have come across terrible effects of long-term sleep deprivation and missing out recommended seven to eight daily hours of sleep, there is some re-assurance coming your way from India's traditional healthcare regime Ayurveda.

Citing a study report, AYUSH Ministry on Tuesday said that the Ayurveda treatment has led to a remarkable improvement in the patient's condition in terms of sleep.
The broad area of study called 'anidra' in Ayurveda deals with sleep-deprivation and related conditions, and it offers some time-tested solutions.

The study, Ministry said, included thorough examination and assessment grading before and after treatment of all the symptoms which were selected for assessment. This included yawning, drowsiness, fatigue and quality of sleep, and improvements were noticed in all the parameters.

The case study, thus, puts forward an instance of "Shirodhara with Ashwagandha Taila accompanied by Shamana Chikitsa" playing a beneficial role in the management of sleep deprivation.

The recent case study published in AyuHom, the research journal of North Eastern Institute of Ayurveda and Homeopathy, Shillong, has brought out new evidence in support of Ayurveda's efficacy in resolving 'anidra'-related issues, the Ministry said in a statement.

The case study is authored by Gopesh Mangal, Associate Professor and Head, PG Department of Panchkarma, National Institute of Ayurveda (NIA), Jaipur along with Nidhi Gupta and Pravesh Srivastava, both PG Scholars in the PG Department of Panchkarma at the NIA.

Medical Science has linked inadequate sleep to a number of health problems ranging from obesity to lowering of immunity. Ayurveda also considers sleep as extremely significant to health.

It is, in fact, described as one among the trayouparasthambha or the three supportive pillars of life; as one of the essential dimensions for happiness and good life and it leads to a relaxed mental state.

Sleep deprivation can be clinically corelated with insomnia which is a common sleep problem worldwide, the Ministry said.

According to World Health Organization (WHO), health is a state of complete physical, mental or social well being and not merely the absence of disease. Sleep is one its essential pre-requisites.

In the present times of erratic lifestyles, stress and other unpredictable environmental factors, the Ministry said, quality of sleep has deteriorated for a large number of people.

According to the estimates of the National Sleep Foundation of America, one-third of people the world over suffer from sleep disorders.

Nanoparticle vaccine

Nanoparticle vaccine candidate for Covid produces antibodies: Study (New Kerala: 20201104)

An innovative nanoparticle vaccine candidate for the Covid-19 virus produces virus-neutralizing antibodies in mice at levels 10X greater than is seen in people who have recovered from the infections, say researchers.

Designed by scientists at the University of Washington School of Medicine in Seattle, the vaccine candidate has been transferred to two companies for clinical development.

Compared to vaccination with the soluble SARS-CoV-2 Spike protein, which is what many leading Covid-19 vaccine candidates are based on, the new nanoparticle vaccine produced ten times more neutralizing antibodies in mice, even at a six-fold lower vaccine dose.

"We hope that our nanoparticle platform may help fight this pandemic that is causing so much damage to our world. The potency, stability, and manufacturability of this vaccine candidate differentiate it from many others under investigation," said study authors from the University of Washington.

The data, published in the journal Cell, also show a strong B-cell response after immunization, which can be critical for immune memory and a durable vaccine effect.

When administered to a single nonhuman primate, the nanoparticle vaccine produced neutralizing antibodies targeting multiple different sites on the Spike protein.

Researchers say this may ensure protection against mutated strains of the virus, should they arise. The Spike protein is part of the coronavirus infectivity machinery.

The vaccine candidate was developed using structure-based vaccine design techniques invented at UW Medicine.

It is a self-assembling protein nanoparticle that displays 60 copies of the SARS-CoV-2 Spike protein's receptor-binding domain in a highly immunogenic array.

The molecular structure of the vaccine roughly mimics that of a virus, which may account for its enhanced ability to provoke an immune response.

"Hundreds of candidate vaccines for Covid-19 are in development around the world. Many require large doses, complex manufacturing, and cold-chain shipping and storage," the researchers wrote.

"An ultrapotent vaccine that is safe, effective at low doses, simple to produce and stable outside of a freezer could enable vaccination against Covid-19 on a global scale," they noted.

**High vitamin D pregnancy**

**High vitamin D pregnancy linked to greater child IQ: Study (New Kerala: 20201104)**

Researchers have found that mothers' vitamin D levels during pregnancy were associated with their children’s IQ, suggesting that higher vitamin D levels in pregnancy may lead to greater childhood IQ scores.

A mother's vitamin D supply is passed to her baby in utero and helps regulate processes including brain development, the study, published in the Journal of Nutrition, reported.

According to the researchers, vitamin D deficiency is common among the general population as well as pregnant women, but 'Black' women are at greater risk.

"Melanin pigment protects the skin against sun damage, but by blocking UV rays, melanin also reduces vitamin D production in the skin," said study lead author Melissa Melough from the Seattle Children's Research Institute in the US.

"Our work brings greater awareness to this problem, shows the long-lasting implications of prenatal vitamin D for the child and their neurocognitive development," Melough added.

According to the study, as many as 80 per cents of Black pregnant women in the US may be deficient in vitamin D.

Of the women who participated in the study, approximately 46 per cent of the mothers were deficient in vitamin D during their pregnancy, and vitamin D levels were lower among Black women compared to White women.

The researchers recruited pregnant women to join the study starting in 2006 and collected information over time about their children's health and development.

After controlling for several other factors related to IQ, higher vitamin D levels in pregnancy were associated with higher IQ in children ages 4 to 6 years old.

Although observational studies like this one cannot prove causation, the research team believes that the findings have important implications and warrant further research.

"People aren't making up that gap through sun exposure or supplementation, people will probably become deficient," the study author wrote,

Foods that contain higher levels of vitamin D include fatty fish, eggs and fortified sources like cow's milk and breakfast cereals.

Additional research is needed to determine the optimal levels of vitamin D in pregnancy, but Melough hopes this study will help to develop nutritional recommendations for pregnant women.
Scientists identify 7 'forms of disease' in mild Covid-19 New Kerala: 20201104


Researchers have shown that there are 'seven forms of disease in mild Covid-19' that leaves behind significant changes in the immune system, even after 10 weeks of contracting the infection.

They identified seven groups of symptoms as "flu-like symptoms (with fever, chills, fatigue and cough), common cold-like symptoms (with rhinitis, sneezing, dry throat and nasal congestion), joint and muscle pain.

"Eye and mucosal inflammation, lung problems (with pneumonia and shortness of breath), gastrointestinal problems (including diarrhoea, nausea and headache) and loss of sense of smell and taste and other symptoms."

"These findings could play a significant role in the treatment of patients and in the development of a potent vaccine," said study authors from the Medical University of Vienna in Austria.

In a study, published in the journal Allergy, the research team examined convalescents and 98 healthy individuals in the control group and were able to show that various symptoms related to Covid-19 occur in symptom groups.

"In the latter group we found that loss of smell and taste predominantly affects individuals with a 'young immune system', measured by the number of immune cells (T lymphocytes) that have recently emigrated from the thymus gland," said study author Winfried F. Pickl.

At the same time, the scientists established that Covid-19 leaves behind long detectable changes in the blood of convalescents, very similar to a fingerprint.

"Our findings contribute to a better understanding of the disease and help us in the development of potential vaccines since we now have access to promising biomarkers and can perform even better monitoring," the scientists wrote.

India’s COVID-19 trajectory

Signs of easing: On India India’s COVID-19 trajectory’s COVID-19 fight (The Hindu: 20201104)

India’s COVID-19 trajectory shows a downward trend, but there is no room for complacency. After reporting over 97,650 novel coronavirus cases on September 11, the largest number ever reported on a single day by any country till then (the U.S. registered 99,780 cases on October 30), India has been witnessing a steady fall in daily fresh cases reported since mid-September. Since October 25, there have been fewer than 50,000 new cases every day, except on one. More importantly, the reduction in daily cases has continued despite no appreciable drop in overall testing numbers, a trend quite pronounced in States that bore the brunt of the pandemic — Maharashtra, Andhra Pradesh, and Tamil Nadu. It is quite clear that the pandemic has peaked by spreading through the major densely populated cities, leaving lakhs infected and thousands dead, but there is a definite slowing down in these areas. Since August, cases had already started to pile up beyond urban areas in rural districts. It is unclear whether the drop in daily cases and deaths registered in the urban areas is playing itself out similarly in rural areas as well, as unlike urban areas, the protocols for testing, treatment, isolation are not as diligently followed because of gaps in the rural health infrastructure across States. This is something State Health Departments need to follow up on.

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Beyond social
राजधानी में रिकॉर्ड 6725 नए कोरोना मरीज मिले

चित्राजनक

नई दिल्ली | वरिष्ठ संवाददाता

दिल्ली में कोरोना संक्रमितों की कुल संख्या चार लाख के पार हो गई है। राजधानी दिल्ली में मंगलवार को एक दिन में रिकॉर्ड 6725 कोरोना संक्रमित मरीज मिले।

दिल्ली में मंगलवार को 48 मरीजों की मौत भी हुई है। वर्षों में 59,440 नमूना की जांच में 11.29% कोरोना संक्रमित मिले हैं। संक्रमण दर बढ़ने से विशेषज्ञों ने चिता जाहिर की है। हालांकि राहत की खबर यह है कि पिछले एक दिन में 3610 मरीजों की छूट भी हुई।

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दिल्ली में कुल संक्रमित मरीजों की संख्या बढ़कर 403,096 पहुंच चुकी है जिनमें से 3,600,69 मरीज तीक चुके हैं जबकि 6652 की मौत हो चुकी है। राजधानी में अभी तक की वायरस की संक्रमण दर बढ़कर 8.36 फीसदी हो गई है। वहीं, कोरोना वायरस की मृत्युदर 1.65 फीसदी दर्ज की गई है।

बेड के लिए भटक रहे फेज 04