

A Rare Outbreak of Guillain-Barré Syndrome in Pune, India.

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Article Info

Received Date: 04 March 2025, **Accepted Date:** 14 March 2025, **Published Date:** 22 March 2025

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Citation: Suresh Kishanrao. (2025). "A Rare Outbreak of Guillain-Barré Syndrome in Pune, India". International Journal of Medical Research and Medical Case Reports, 2(2); DOI: <http://03.2025/IJMRMCR/019>.

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Abstract

Polio like Acute Flaccid Paralysis disorders have been referred to in scientific literature for centuries, a formal name of Guillain-Barré Syndrome was first introduced in 1916, after the scientists who first identified these disorders. Guillain-Barre Syndrome is a rare immunological nerve disorder that causes sudden numbness and muscle weakness, as the body's immune system attacks the nerves. It begins with tingling or numbness in the feet and hands, followed by muscle weakness and difficulty in moving joints. Symptoms worsen over two to four weeks, typically starting in the arms and legs. While GBS is prevalent in both Pediatric and young-age groups, it will not lead to an epidemic or pandemic, and most patients recover fully with treatment. GBS is not uncommon in India. However, starting on January 9, as of 3 March 2025 Pune has reported more than 200 confirmed cases and a death toll of 11. The good news is that no new hospital admissions for two consecutive days, 1 & 2 March 2025.

GBS outbreaks are rare and therefore get media attention. More recently, outbreaks linked to the pathogen have been reported from all over the world. In the first seven months of 2023, Peru reported over 200 suspected cases and at least four deaths of GBS and two-thirds of the cases were linked to campylobacter. In countries with good hygiene, fewer GBS cases are linked to campylobacters, with respiratory infections being a major contributor. Campylobacters are endemic with hundreds of

thousands of cases taking place all the time existing in the environment. It is estimated that about one in 100 campylobacter strains carry the GBS risk, and one in 100 people infected with such a strain develop GBS, making the overall risk roughly one in 10,000. That creates an "immunological Russian roulette", triggering an "acute neurological tsunami" that surges through the peripheral nervous system. Once the immune response subsides, the attack wanes, but affected people need time, medical care, and support to repair the damage. What makes things worse is that there is no cure for GBS. During 2013-2015 French Polynesia (2013-14), Brazil (2015), Peru (2019), Vaccines can rarely trigger GBS, except a lone Covid vaccine linked to a few hundred GBS cases in the UK in 2021.

Materials& Methods: This article is based IDSP reports of the State of Maharashtra & GOI (NCDC) and Media reports of national and local newspapers, supplemented by literature review and some case reports

Outcome: More than 200 cases and 11 deaths were reported in a period of 8 weeks from 9th January 2025. This outbreak is a scary reminder of how poor government/Municipal services can create Public Health Challenges! Most Indians face either no piped water supply or contaminated piped water due to poor infrastructure, inadequate treatment & unchecked water contamination. Therefore, the Government needs to address both quantity (number of piped connections

houses) and the quality (purification and integrity of the supply).

Introduction:

As of March 3, 2025, the Guillain-Barré Syndrome (GBS) outbreak in Pune shows no new hospital admissions for two consecutive days, with the total case count exceeding 200, and a death toll of 11; most cases are linked to contaminated drinking water, with active monitoring the situation and conducting door-to-door surveys for potential symptoms.

Latest update from reliable sources point to; i) No fresh GBS cases were admitted to hospitals in Pune for the past two days ii) Death toll remains at 11 iii) Investigations point towards contaminated drinking water as the likely source of the outbreak iv) Ongoing monitoring of the situation & door-to-door surveys to identify potential cases, v) Businesses of street food vendors have declined due to customers concerns about water safety.

Since the outbreak began on January 9, as of 3 March 2025 Pune has reported more than 200 confirmed cases of GBS. Of the total cases, 39 patients were from Pune Municipal (PMC) Corporation areas, 91 were from newly added villages in the civic area, 29 were from Pimpri Chinchwad civic body, 25 were from Pune rural region and rest were from other districts. Among these cases, 91 patients have been discharged, 48 were in ICU and 21 were on ventilators. Hospitals in Pune, Maharashtra reported seeing unusual rise in number of Acute Flaccid Paralysis (AFP) attributable to Guillain-Barre Syndrome since 9th January 2025. A maximum of twenty cases were reported on our Republic Day 26 January 2025. Given the current national AFP rate of 0.3/100000 population, Pune is expected to report about 74 cases in an entire year, as against 170 cases in over 4 weeks period, making January-February 2025 an outbreak period. Some of the stool samples were positive for Campylobacter Jejuni bacteria, which is known to cause one third of GBS case globally.

The gender preference of cases was in favor of male was clear as M 2: F 1 ratio of total cases. A 41-year-old male chartered accountant working in Pune was the first casualty of the Guillain-Barre Syndrome (GBS) who died in a Solapur hospital on January 25.

Guillain-Barre Syndrome is a rare immunological nerve disorder that causes sudden numbness and muscle weakness, as the body's immune system attacks the nerves. The State health department & the Pune

Municipal Corporation (PMC) are reassuring and requesting "People not to panic as the recovery rate for GBS is high and appealing to the population to take any person who feels sudden weakness in the arms and legs, to consult their family doctor or go to the nearest government hospital. The State's Mahatma Phule Health Scheme covers free treatment up to Rs 2 lakh. Concrete measures are being implemented to ensure supply of clean drinking water in the affected areas.

After weeks of investigation, on February 4, health officials confirmed that Campylobacter jejuni, a bacterium commonly associated with foodborne illnesses, had infiltrated the water supply and is believed to be the primary cause of the GBS outbreak, further fueling fears about the safety of the city's water!

This article is based on a recent outbreak media report of GBS. While GBS is prevalent in both Pediatric and young-age groups, it will not lead to an epidemic or pandemic, and most patients recover fully with treatment.

Case Reports:

1. **An elderly case of GBS:** A 60-year-old male patient admitted to the male medicine ward of private tertiary care hospital with a chief complaint of weakness in B/L upper limb and B/L lower limb from 5-7 days on 15 January 2025. The upper limbs had grade 3 muscle power and the lower limbs grade 1 on admission. Laboratory investigation of biochemistry analysis showed CSF protein (181mg/dl), neutrophils (91%), and S. Urea (44.0 mg/dl). Radiological investigation CT scan of the brain showed atrophic changes and MRI cervical spine -shows cervical spondylosis with compression myelopathic changes at C4, and C5 level and multilevel disc herniation and bulges. Nerve conduction studies of all four limbs, sampling from the median, ulnar, peroneal, tibial, and sural nerves, showed B/L Upper and Lower limb (sensor + motor) demyelinating polyneuropathy, more pronounced in the upper limb than in the lower limbs. The patient received antibiotics, analgesics, muscle relaxants, multivitamins, and other supportive measures. Intravenous immunoglobulin infusion was started due to the patient's symptoms steadily getting worse, and soon after that, things started to get better for the patient and by 5th February 2025 the patient recovered muscle strength up to grade 4 muscle power.
2. Prema, a 56-year-old female, presented to the emergency department of a Government Hospital

on 18th January 2025 with a complaint of numbness and tingling in his feet and hands along with pain that got worse with movement. In history she gave of an episode of severe gastrointestinal infection approximately 5 months ago, which was she was treated for 5 days and then discharged home with no change in baseline or complications. During the recent two weeks she started feeling weaker and the tingling, which progressively worsened, eventually leading to admission to the same hospital's emergency department. Prema could hardly move for 2 weeks and required ICU medical support. The healthcare team ensured that she at least attempted to mobilize routinely and was positioned properly to avoid contractures. It has been 4 weeks since her last admission to the hospital and her medical status has remained stable. Her treatment included immunoglobulin injections & rehabilitation by a graded approach centered around the capacity to perform functional activities.

3. **Client Characteristics:** Patient Profile: 56 years old, Female, Primary Complaint: Pain in feet, weakness in upper and lower extremity, fatigue, lack of coordination. Medical Diagnosis: Guillain-Barre Syndrome & Hypertension and Inability to perform with some ADLs without support. Activities of daily living (ADLs) are essential self-care tasks such as eating with utensils, toileting, bathing and grooming. Prognosis so far: Mobility, endurance and coordination levels have not yet returned to pre GBS levels. Declines in participation in previously enjoyed social events.
4. **Mr. Aditya, a typical GBS case:** Mr. Aditya a 32 year old felt severe abdominal cramps and diarrhea on 14 January 2025. Within 5 days, he began having difficulty walking and rushed to a Pune private hospital complaining of breathing difficulty, where the neurologist diagnosed it to be GBS cases on 20th January.
5. **Nitin Narayan a case of Quadriplegia:** On 31 December 2024, Mr. Nitin Narayan a 42 year old Delhi based PR consultant ate chicken outside of his home on a profession trip and now feels probably it was under-cooked retrospectively, A week later his hands began to get stiff and by the second week of January 2025, felt all the energy slipping out of his body as he was unable to get off from his Sofa but couldn't move his muscles. In a private Secondary care hospital in Pune was diagnosed as GSB case. Narayan was one of those who got paralyzed below neck. It took several doses of expensive immunoglobulin injections and extensive physiotherapy for him to get back to his feet over the next 10 weeks. Though he has not fully recovered now, his fingers tremble even now due to residual weakness. The doctors suspect the poorly cooked chicken is a source of infection in this case.
6. **Poona and Noble hospitals report seeing good recoveries:** A 50-year-old woman in ICU, who initially had 'grade 0' muscle power was diagnosed with the most severe axonal variant of GBS, which directly affects nerve fiber, which is associated with slower recovery and greater disability, miraculously recovered with muscle strength now at 'grade 3'. She was given intravenous immunoglobulin (IVIg) and needed high-flow oxygen support." Another 28-year-old man who was on ventilator for five days, with complete paralysis (grade 0 muscle power), recovered and can walk and muscle back at grade 4.
7. **Sassoon hospital Pune:** had discharged five patients on Sunday the 2 February 2025, out of the 28 people including 4 people in critical state with GBS admitted since Jan 15. Five of the patients had quadriplegia affecting all four limbs, with one of them experiencing paralysis of swallowing and speaking muscles. They were hospitalized for 8 to 10 days with three receiving plasmapheresis and two undergoing IVIG treatment, along with physiotherapy and supportive care.
8. **Inability to Hold a pencil turns to be GBS:** In early January 2025, a schoolteacher in the city of Pune found her six-year-old son upset about homework, as she erased some words and asked him to write them. She assumed that he was angry and therefore not holding the pencil properly, but in the next few days, the boy was unable to move his arms or legs. As his condition worsened, he lost the ability to swallow, speak, and eventually breathe, and was admitted to a tertiary care hospital in intensive care, requiring ventilator support. His struggle to hold a pencil was the first sign of Guillain-Barré Syndrome (GBS), He is now recovering.
9. **Case Fatality:** A driver who worked as a driver in Pune was initially taken to a Pune hospital after he complained of weakness in his lower limbs. However, his relatives decided to transfer him to Nippani in Karnataka on February 1, before seeking treatment at a hospital in Sangli, where he was administered intravenous immunoglobulin (IVIg), a common treatment for GBS. Despite this, his condition worsened, and on February 5, the patient was readmitted to Pune's Kamala Nehru Hospital, where he suffered supra-ventricular tachycardia, and cardiac arrest on February 9 and died.

Discussion:

GBS-like disorders have been referred to in scientific literature for centuries, a formal name of Guillain-Barré Syndrome was first introduced in 1916, after the scientists who first identified these disorders. GBS begins with tingling or numbness in the feet and hands, followed by muscle weakness and difficulty moving joints. Symptoms worsen over two to four weeks, typically starting in the arms and legs. GBS is not uncommon in India. A Bangalore-based National Institute of Mental Health and Neurosciences (NIMHANS), study of 150 GBS patients over a five-year period between 2014 and 2019, reported that 79% of the patients had evidence of prior infections, with a third testing positive for campylobacter. Notably, co-infections were more common, occurring in 65%, suggesting a complex interplay of bacteria and viruses. The mortality rate reported in various studies varies between 3 and 13%, depending on severity and quality of health care support.

The Pune outbreak is traced to *Campylobacter jejuni*



GBS is basically an endemic condition, making that as a benchmark indicator of Acid Flaccid Paralysis Surveillance Indicator in Polio eradication Program. However, outbreaks are rare. More recently, outbreaks linked to the pathogen have been reported from all over the world. In the first seven months of 2023, Peru reported over 200 suspected cases and at least four deaths of GBS and two-thirds of the cases were linked to campylobacter. In countries with good hygiene, fewer GBS cases are linked to campylobacters, with respiratory infections being a major contributor. Campylobacters are endemic with hundreds of thousands of cases taking place all the time existing in the environment. It is estimated that about one in 100 campylobacter strains carry the GBS risk, and one in 100 people infected with such a strain develop GBS, making the overall risk roughly one in 10,000. That creates an "immunological Russian roulette", triggering an "acute neurological tsunami" that surges through

the peripheral nervous system. Once the immune response subsides, the attack wanes – but the body still needs time, medical care, and support to repair the damage. What makes things worse is that there is no cure for GBS.

In 2015 Brazil reported a cluster of GBS cases linked to the Zika virus. Similar outbreaks have been documented in Peru, Latin America and the Caribbean following the Zika virus outbreak. Outbreaks of GBS were reported in French Polynesia in 2013-2014 and in Latin America and the Caribbean in 2015-2016, after outbreaks of Zika virus infection. Peru reported 600 cases in an outbreak of GBS in 2019. Vaccines can rarely trigger GBS, except a lone Covid vaccine linked to a few hundred GBS cases in the UK in 2021.

Recently Clinicians have changed GBS name to Acute Inflammatory Demyelinating Polyneuropathy (AIDP). Neurologists treat this condition because it is an autoimmune disease' because of abnormal immune function, either due to an autoimmune response or an exaggerated inflammatory response. Activities of Daily Living (ADLs) are tasks related to personal care and daily life which form key features of AIDP. Task like Bathing or showering, Dressing, getting in and out of bed or a chair, Walking, Using the toilet, eating, preparing meals, managing money, shopping, and doing housework which indicate individual's functional status. ADLs are fundamental to caring for oneself & maintaining independence.

As there is no single test to diagnose GBS, the diagnosis is mainly based on clinical features, presenting itself as a form of paralysis which can be also caused by polio, viruses or rare neurological disease. The diagnosis is a constellation of clinical features, therefore, a Misdiagnosis or no diagnosis or late diagnosis happens easily. India's uneven public health system presents a challenge, as doctors in rural areas may struggle to diagnose GBS, a reason, possibly, why the National expert's group and the World Health Organization (WHO) teams are in Pune, is collaborating with federal and state health workers to trace, test, and monitor cases, and analyzing trends to support effective treatment. Activities of Daily Living

The definition of ADLs do vary, but most organizations agree on five basic categories:

1. personal hygiene: includes a range of tasks, such as bathing, grooming and oral care
2. dressing: includes the ability to make appropriate clothing decisions

3. eating: the ability to feed yourself; does not necessarily include preparing food
4. maintaining continence
5. transferring: e.g. moving from sitting to standing or getting in and out of bed

Government Response:

As part of house-to-house surveillance, officials surveyed 81,944 houses, including 45,574 in Pune Municipal Corporation (PMC), 23,179 in Pimpri Chinchwad Municipal Corporation (PCMC), and 13,191 in Pune rural areas. Additionally, 80 serum samples have been sent to NIMHANS Bengaluru for Antiganglioside and Antibodies testing. The state health department has issued guidelines urging people to boil and purify drinking water to maintain quality. Citizens are advised to keep their food fresh and avoid consuming stale or partially cooked meat such as chicken or mutton.

A total of 3,868 water samples from different parts of the city have been sent for chemical and biological analysis at the Public Health Laboratory. Of these, samples from 37 water sources were found to be contaminated, prompting authorities to increase health awareness campaigns. Private medical practitioners have been urged to report any GBS cases to the public health authorities. The state government has assured citizens that there is no need to panic as health officials are fully prepared to implement preventive and control measures.

History of Capturing GBS under AFP surveillance in India:

Cases of GBS are reported by health facilities both public and private and traditional healers some of whom claim curing polio or paralysis, though it is a natural history of the disease. "AFP Surveillance" refers to a robust system for monitoring cases of Acute Flaccid Paralysis (AFP), or Polio like Illnesses (PLI) established under National Polio Eradication Project (NPSP) since 1997, primarily used to monitor completeness of reporting of potential polio cases. Two periods (P) are described regarding AFP detection goals. The first, P1 (1998–2006), when the AFP rate ranged from 0.78/100,000 in 1998 to 0.66/100,000 in 2006; though the rate peaked in 2001 at 0.84/100,000 under 15 years population. The second period, P2 (2007–2015), showed an AFP rate ranging from 0.57/100,000 in 2007 to 0.43/100,000 in 2015 and in the last decade it has been around 0.3/100,000 population.

The National Polio Surveillance Unit of India actively

collects all cases of acute flaccid paralysis (AFP) in children <15 years old, including cases of GBS of diagnostic certainty of AFP cases, demographic information, and laboratory results of stool samples collected for poliovirus analysis. Case definitions of GBS were recently developed in response to the 2009 H1N1 vaccination program though field tested in 2002-2003, using available cerebrospinal fluid (CSF) and nerve conduction studies (NCS) results, neurological examination, clinical history, and exclusion of related diagnoses [4]. Sensitivity of the Brighton GBS criteria for level 3 of diagnostic certainty requires no clinical laboratory testing, level 2 employs CSF or NCS, and level 1 employs both.

On 13 January 2025, India completes 14 polio-free years – a remarkable achievement that was made because of consistent, determined efforts and genuine commitment at all levels. India was declared Polio free on 27th March 2014 by the WHO though it seemed impossible until it was done. The last case of wild virus polio in India was reported in January 2011.

Given this background Maharashtra, with a projected population in 2025 of 133,870,000, is expected to report 133801340 AFP cases in a year and Pune district with a population of 7,39,000 is expected to report about 74 cases in a year. The chance of an individual in India developing GBS in their lifetime is around 1 in 1,000.

Epidemiology of GBS:

Guillain-Barré Syndrome (GBS) is an autoimmune neurological disorder in which a person's immune system attacks their peripheral nerves, leading to muscle weakness that can progress to paralysis. It can develop over a few days or several weeks. People of any age can be affected, but it is more common in adults and males. The condition is rare, with an estimated incidence of less than 0.5/100,000 under 15 yrs. population. Bacterial and viral infections generally lead to GBS as they weaken the immunity of patients. The exact cause of Guillain-Barre Syndrome is still unknown. In most cases, it isn't preventable. Guillain-Barre Syndrome requires immediate treatment and hospitalization. Individuals experiencing any of the following symptoms must seek consultation immediately as some of the severe cases may require intensive care: i) Weakness and tingling in feet and legs ii) Unsteady walking iii) Difficulty in climbing stairs iv) Double vision v) Rapid heart rate or palpitation vi) Severe cramping vii) Pins and needles feeling in fingers, toes, ankles and wrists and viii) Low blood pressure ix) These symptoms become prominent after respiratory

or digestive tract infection. Muscle weakness can also turn into paralysis in a few cases.

Symptoms:

GBS is a serious neurological emergency that can cause acute flaccid paralysis as indicated by sudden weakness in the distal muscles, usually symmetrical, Loss of vasomotor control, causing blood pressure fluctuations, postural hypotension, and cardiac arrhythmias. Complications of Guillain-Barre Syndrome include trouble breathing, heart-related issues, pain, blood clots and impaired bowel or bladder function GBS is more likely to affect men than women, likely to affect people as they get older and is often preceded by a viral or bacterial infection, such as the flu, Campylobacter Jejuni gastroenteritis, or cytomegalovirus. GBS is triggered by trauma, surgery, or vaccination [5].

Diagnosis & Treatment:

GBS is diagnosed using cerebrospinal fluid analysis & electrodiagnostic testing and treated with supportive care, IVIG, or plasmapheresis

Conclusion:

Pune district in Maharashtra state, India witnessed a rare outbreak of GBS outbreak. Since the outbreak began on January 9, as of 3 March 2025 Pune has reported more than 200 confirmed cases of GBS and 11 deaths attributable to the condition.

This outbreak is a scary reminder of how poor government/Municipal services can create Public Health Challenges! Most Indians face either no piped waters or contaminated piped water due to poor infrastructure, inadequate treatment & unchecked water contamination.

The national & State Governments and Local Municipalities need to address both quantity (number of piped connections houses) & the quality (purification and integrity of the supply)

References:

1. Rise in Guillain Barre Syndrome cases in Maharashtra, Sudhir Suryawanshi, <https://www.newindianexpress.com/nation/2025/Feb/06/> 10:37 pm.

2. Central govt issues guidelines for GBS management in Maharashtra, <https://www.hindustantimes.com/02/07/25>
3. Guillain-Barré Syndrome cases over 200 and 11 deaths, in Pune, <https://www.thehindu.com/03/03/2025>
4. Guillain-Barré Syndrome in India: Population-based validation of the Brighton criteria, Farrah J Mateen
5. Guillain-Barré syndrome: epidemiology, pathophysiology and management, <https://pubmed.ncbi.nlm.nih.gov/15018590/> 2004;64(6):597-610. Doi: 10.2165/00003495-200464060-00003.
6. Incidence of GBS atypical, <https://health.economictimes.indiatimes.com/02/04/2025>