

A REPORT ON *NAEGLERIA FOWLERI* OUTBREAKS IN PAKISTAN

Tabassam Fatima¹, Sehar Shahzad^{1*}, Seemal Shafiq¹, Rameen Sakeena¹

1. Riphah international university, Lahore, Pakistan.

*Corresponding author: sehar.shahzad.01@gmail.com

ABSTRACT

Naegleria (N.) fowleri is a brain-eating amoeba falling under the category of pathogenic protozoa with a mortality rate of over 90%. In the developing stages, it's a motile trophozoite preferring a warm environment. It is mainly focused on the case reports of *N. fowleri* in Pakistan.

Introduction:

Naegleria (N.) fowleri is known as brain brain-eating amoeba. It belongs to the phylum Percolozoa. It is a shape-shifting amoeba flagellate. It feeds primarily on bacteria but in humans, it can become pathogenic. It can cause a fatal brain infection known as primary amoebic meningoencephalitis (PAM). Mostly it has affected Asian countries. Its mortality rate is 95-99%.

Life Cycle

Its life cycle consists of a motile, feeding trophozoite stage. It is found in fresh warm water bodies such as soil, rivers, lakes, poorly maintained swimming pools, and hot tubs. It feeds on the bacteria that are found in the neighborhood of their living place.

Clinical signs and symptoms

Early signs of illness are headache, vomiting, nausea, fatigue, pyrexia, neck stiffness, and anorexia. Symptoms in case of severe illness are photophobia, hemorrhages, hallucinations convulsions, cranial nerve abnormalities, and coma.

List of *N. fowleri* Outbreaks in Pakistan

The following data describes the outbreak in different years and the number of cases.

1. The Year 2008

The number of cases reported in 2008 was 2. Higher incidence was reported in males of ages 25 and 35. No incidence was reported in females thus exempting them from being the target. The outbreak mainland was Karachi (1).

2. The Year 2009

The number of cases reported in 2009 was 11. The target population was diverse with both males and females being targeted. Incidence was reported in age groups of 16 to 64. (2)

3. The Year 2010

The number of cases reported was 20 in 2010 with people of all age groups being targeted without any gender specification (3).

4. The Year 2011

The number of cases reported in 2011 was 13 with no age or gender specification. The targeted area was mainly Karachi (4).

5. The Year 2012

The number of cases reported was 22 with only males being the target population. No age specification was recorded. The targeted area was mainly Karachi (5).

6. The Year 2013

The number of cases reported in 2013 was 3. The main target population included males of ages 14 to 40. The targeted area was mainly Karachi.

7. The Year 2014

The number of cases reported in 2014 was 14 with a higher incidence in males of ages 14 to 40 years. The targeted area was mainly Karachi.

8. The Year 2015

The number of cases reported in 2015 was 13 with a high incidence in males but females also constituted patient reports. Age groups affected included 16 to 56 years. 3 cases in females and 10 in males were reported. The targeted area was mainly Karachi.

9. The Year 2016

The cases reported in 2016 were 5 with no record of age or gender specification. The targeted area was mainly Karachi .

10. The Year 2017

The number of deaths recorded this year reached a total of 6 with no record of age or gender. The targeted area was mainly Karachi.

11. The Year 2018

The number of deaths reported was 7 with no record of age or gender specification. The targeted area was mainly Karachi.

12. The Year 2019

11 deaths were reported. Age groups affected from 21 to 45 years old. 10 Males were affected. The number of deaths reported was 11 with a higher incidence in males of age groups 21 to 45 years. The targeted area was mainly Karachi.

13. The Year 2020

The number of cases reported was 16 in 2020 with no record of age or gender specification. The targeted area was mainly Karachi.

14. The Year 2021

The number of cases reported was with no gender record being specified. the only patient reported was 18 years old. The targeted area was mainly Karachi.

15. The Year 2022

The number of cases reported was 5 with 2 male patients of age 59 years, 1 case of 38 years patient, and 1 case of 28 years patient. The targeted area was mainly Karachi.

16. The Year 2023

The number of cases reported was 5 with a patient of 21 years, and another one of 45 years. A female and 2 male patients were reported. The other 2 patients were not specified. The targeted area was mainly Karachi.

Conclusion

The disease is prevalent in Pakistan with a high mortality being reported in the affected number of patients. It is high time that the government takes preventive measures to control the disease and ensure a safe living environment masses

References

- [1] Shakoor S, Beg MA, Mahmood SF, Bandea R, Sriram R, Noman F, Ali F, Visvesvara GS, Zafar A. Primary amebic meningoencephalitis caused by *Naegleria fowleri*, Karachi, Pakistan. *Emerging infectious diseases*. 2011 Feb;17(2):258.
- [2] Saleem T, Rabbani M, Jamil B. Primary amoebic meningoencephalitis: two new cases from Pakistan. *Tropical doctor*. 2009 Oct;39(4):242-3.
- [3] Siddiqui R, Khan NA. Is ritual cleansing a missing link between fatal infection and brain-eating amoebae?. *Clinical infectious diseases*. 2012 Jun 15;54(12):1817-8.
- [4] Shakoor S, Beg MA, Mahmood SF, Bandea R, Sriram R, Noman F, Ali F, Visvesvara GS, Zafar A. Primary amebic meningoencephalitis caused by *Naegleria fowleri*, Karachi, Pakistan. *Emerging infectious diseases*. 2011 Feb;17(2):258.
- [5] Naqvi AA, Yazdani N, Ahmad R, Zehra F, Ahmad N. Epidemiology of primary amoebic meningoencephalitis-related deaths due to *Naegleria fowleri* infections from freshwater in Pakistan: An analysis of 8-year dataset. *Archives of Pharmacy Practice*. 2016 Oct 1;7(4).