INTRODUCTION

Small free living Amoebae belonging to the genus *Acanthamoeba* occur worldwide and show a cosmopolitan distribution. They have been isolated from diverse environmental sources including fresh and frozen water; vegetables; heating, ventilating, and air conditioning units, cooling towers of electrical and nuclear power plants, Sewage, medicinal pools; community swimming pools, dental treatment units, dialysis units, bacterial, fungal and mammalian cell cultures, corneal scrapings, contact lens solutions, skin lesions, and central nervous system of humans\(^1\). *Acanthamoeba* spp causing granulomatous amoebic encephalitis (GAE) and *Acanthamoeba* keratitis (AK) are most commonly reported in the recent past. The first case of *Acanthamoeba* keratitis occurred in 1972 in a Texas farmer who was struck in his eye by a straw particle\(^4\).

Classification of *Acanthamoeba*

Kingdom: Protista
Subkingdom: Protozoa
Phylum: Sarcomastigophora
Subphylum: Sarcodina
Superclass: Rhizopoda
Order: *Amoebida*
Suborder: *Acanthopodina*
Family: *Acanthamoebidae*
Genus: *Acanthamoeba*
Habitat

*Acanthamoebae* are present in air, water and soil of different environment and show a cosmopolitan distribution.

Growth and Reproduction

They are free living saprophytic organisms that reproduce by binary fission with dissolution of the nuclear membrane at prophase. Trophozoite and cyst forms are seen in their life cycle.

The genus *Acanthamoeba* has been established in the year 1931\(^5\). The following are the generic characters of *Acanthamoeba* trophozoites. They are flat and irregular and produce pointed, slender and flexible micropseudopodia called acanthopodia from the surface. The cysts are polyhedral or convex with double walls, an outermost ectocyst, and an inner endocyst. The two walls meet at different places, and pores or ostioles are evident at the junction of the walls. A plug called operculum closes each pore\(^6\).

A detailed work on the taxonomy of *Acanthamoeba* by Singh \(^7\); Singh and Das \(^8\), Pussard \(^9\) and Page \(^10\) established the generic character. On the basis of the differences in the size as well as in the morphology of the cyst, Pussard and Pons in 1977\(^11\) classified *Acanthamoeba* into three different groups within the genus. In addition to morphology, isoenzyme profiles and restriction fragment length polymorphism (RFLPs) of the mitochondrial DNA \(^12\text{-}15\) have also been made for the classification of Pussard and Pons with few changes.
Group I consists of four species.

They are:  
1. *A.astronyxis*  
2. *A.commandoni*  
3. *A.tubiashi*  
4. *A.echinulata*

Group II includes 13 species.

They are:  
1. *A.castellanii*  
2. *A.polyphaga*  
3. *A.rhysodes*  
4. *A.griffini*  
5. *A.hatchetti*  
6. *A.triangularis*  
7. *A.divionesis*  
8. *A.paradivionesis*  
9. *A.mauritaniensis*  
10. *A.lugdunensis*  
11. *A.quina*  
12. *A.leptocnemus*  
13. *A.vermiformis*

Group III includes 8 species.

They are:  
1. *A.culbertsoni*  
2. *A.palestinensis*  
3. *A.pustulosa*  
4. *A.roybera*  
5. *A.lenticulata*  
6. *A.glebae*  
7. *A.exudans*  
8. *A.jacobsoni sp. N*
Acanthamoeba keratitis is a serious clinical entity, which occurs more frequently than is generally believed to be. In most of the earlier reported cases, a primary diagnosis of Acanthamoeba keratitis was not made and a delay in correct diagnosis ranged from weeks to months. Infection of Acanthamoeba can be devastating with prolonged morbidity if the condition remains untreated. Despite awareness of the likelihood of Acanthamoeba keratitis, medical misjudgments continue to occur. This is primarily due to the similarity in clinical presentation to that of viral keratitis. Early suspicion leads to simple readily available diagnostic microbiologic studies which can immediately confirm the diagnosis and permit
more timely, aggressive and possibly more efficacious management. Otherwise it has prolonged and painful course with poor visual outcome.

The typical features of early disease are punctuate keratitis, keratopathy, pseudo dendritis, and epithelial infiltrates, diffused and focal sub epithelial infiltrates and keratoneuritis. Epithelial defects are relatively uncommon in early disease. Limbitis and anterior scleritis are common early features and associated with severe pain.

The late disease appears with ring infiltrates and corneal ulceration, which is some times indolent and some times relapsing, and rarely seen with four weeks of the onset of symptom. Polymicrobial infection with bacteria and fungi may be more common.

If the diagnosis is missed, the eye becomes excessively painful. This is due to amoebic invasion of the corneal nerves, a feature which is recognized as radial keratoneuritis. In addition, there is progressive infiltration or abscess formation, keratolysis, scleritis and substantial risk of blindness.

The current work has been carried out to study the incidence of Acanthamoeba keratitis at two different Ophthalmic hospitals viz. Aravind Eye hospital and Post Graduate Institute of Ophthalmology (Madurai) and Regional Institute of Ophthalmology and Government Ophthalmic Hospital (Chennai). The Pathogenicity of the isolates and the immune responses to Acanthamoeba are the salient features of this study.