Uveitis can cause permanent structural damage to the eye which results in incurable blindness. The estimated annual incidence in developing countries is 52.4 per 100,000 person-years. More than 50% of all uveitis patients develop secondary complications and up to 35% of patients suffer severe visual impairment which accounts for 5–20% of legal blindness in both the United States and Europe. In developing countries, uveitis occurs in up to 714 per 100,000 in the population 5 and cause up to 25% of blindness. But still the significant visual loss and blindness may be underestimated in these countries.

Different factors including race, geographical location, socioeconomics and the environment can all affect the prevalence of uveitis between different societies. Uveitis doesn’t seem to have sexual predilections as seen in most series. Uveitis can affect any age group, but people aged from 20 to 60 years are most commonly affected. The incidence of uveitis in children is much lower than that in adults in Northern Europe, and comprises 5–10% of the total uveitis population.

The causative agents of uveitis include infectious or noninfectious systemic or ocular disease and masquerade syndromes. Infections causing uveitis are more common in the developing world, accounting for 30–50% of all cases of uveitis in this part of the world. Socioeconomic factors play an important role in developing countries in which poverty, overcrowding, and poor nutrition can promote infection. In developed countries, infectious uveitis is less common accounting 11% to 21% of uveitis cases.

Uveitis may be a presenting sign of life-threatening systemic diseases such as vasculitis. Proper diagnosis and treatment of uveitis and the associated systemic illnesses can reduce the resultant morbidity and mortality. Studies from tertiary referral centers in different parts of the world, showed that anterior uveitis is the commonest type of uveitis, followed by posterior or panuveitis and intermediate uveitis.

The peak age of onset is during the highly productive years, and the potential for severe visual loss highlights the seriousness of the impact of uveitis on patients and communities. Knowledge of the typical clinical features of uveitis and its epidemiology is essential in making an accurate diagnosis and starting early appropriate treatment.

Studies that describe the epidemiology of uveitis in Africa are very scarce. We do not have adequate published data on the clinical presentation of uveitis in Ethiopia. This study was therefore conducted to enable us to have baseline knowledge on clinical presentations, severity of visual impairment and secondary complications of uveitis.

**Patient and method**

Institutional based cross-sectional study was carried out to assess clinical presentations of uveitis at the University of Gondar Tertiary Eye Care and Training Center from August 2017 to July 2018.

All patients with a diagnosis of uveitis who visited the outpatient clinics of the center during the study period were studied.

Data were collected using a standardized checklist and data extraction format which consisted of history, review of the systems, presenting visual acuity and intraocular pressure measurement.

Tumbling-E Snellen’s charts were used to measure visual acuity. Grading of visual impairment and blindness was done according to the WHO classification system as follows: visual acuity better or equal to 6/18 – normal; visual acuity less than
or equal to 6/24 and better than 6/60 – moderate visual impairment; visual acuity less than or equal to 6/60 and better than counting fingers at 3 m – severe visual impairment; visual acuity less than or equal to counting fingers at 3 m – blindness; for bilateral blindness the result of the eye with the better presenting visual acuity were recorded. Detailed anterior segment examination with a slit lamp and dilated fundus examination with a slit lamp using 90D lens was done.

Uveitis was classified as anterior, intermediate, posterior and panuveitis based on Standardization of Uveitis Nomenclature (SUN) working group classification system. Diagnosis of uveitis was confirmed by an ophthalmologist. For patients with bilateral disease, recurrent unilateral disease, pan uveitis, granulomatous uveitis, posterior uveitis, manifestations of associated systemic disease and disease resistant to treatment, available investigations which included complete blood cell count (CBC), erythrocyte sedimentation rate (ESR), HIV serology, tripanona pallidom hemagglutination assay (TPHA), antinuclear antibody (ANA), rheumatoid factor (RF), chest x-ray and anti-toxoplasma serology were done and results recorded on the data extraction format. For patients with signs of old or active anterior uveitis (Iritis) but with media opacities such as cataract and/or vitreous opacities ocular ultrasound was done to rule out involvement of the vitreous retina and choroid in the inflammation.

The collected data were checked for accuracy, coded, cleaned and entered in to Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, USA version 21). Descriptive statistics was used in the analysis.

The study was undertaken in full compliance with the 2013 Declaration on research involving human subjects. Prior to commencement of the study, Ethical clearance was obtained from the Ethics Committee (Institutional Review Board) of University of Gondar with reference number GUEB233/2017.

Results
A total of 105 eyes of 82 patients were enrolled in the study. The mean age of patients was 33.8 ± 14.8 years (range 7 to 80 years) and 41(50%) patients were in the age group between 19 and 39 years. Males accounted 65% (53/82) and females 35% (29/82), with male to female ratio of 1:8:1. Forty six (56%) patients were from urban area and 36(44%) were from rural area.

Anterior uveitis was found in 47 (57%) of the patients, Intermediate Uveitis in 17 (21%), posterior uveitis in 8 (10%), and pan uveitis in 10 (12%) of the population. Unilateral Uveitis was found in 59 (72%) and bilateral disease was present in 23 (28%) of the study population.

Seventy four percent of anterior uveitis cases were unilateral while 26% were bilateral. Intermediate uveitis was unilateral in 65% and bilateral in 35%. Posterior uveitis was unilateral in 87% and bilateral in 13%. Pan uveitis was unilateral in 60% and bilateral in 40%.

Reduction of vision was the commonest presenting complaint seen in 62 (75.6%) of patients followed by eye pain 22 (26%) and redness/photophobia 17 (21%). The clinical presentation was an insidious onset in 68% (56/82) and sudden onset in 32% (26/82) of patients. Only 39% of patients came within one month of the onset of symptoms and the remaining 61% came later than one month after the disease onset.

Based on presenting visual acuity of patients in the better eye, 19 (23%) patients were blind and 7 (8.5%) had severe visual impairment. Moderate vision impairment was found in 7 (8.5%) and 49 (60%) had normal vision.

Among patients with unilateral uveitis 61% (36/59) eyes were blind, 10% (6/59) eyes had severe visual impairment, 12% (7/59) eyes had moderate visual impairment and 17% (10/59) eyes normal vision (Figure 1).

Among patients with bilateral uveitis 65% (30/46) eyes were blind 14% (3/46) eyes had severe visual impairment, 23% (5/46) eyes had moderate visual impairment and 17% (8/46) normal vision (Figure 2).

Out of the 105 eyes studied, 18% (19/105) had normal vision, 10.5% (12/105) had moderate visual impairment, 8.5% (9/105) had severe visual impairment, 63% (66/105) were blind (Figure 3).

Based on clinical examination findings and laboratory data, specific diagnosis was made in 28% (23/82) of patients and in the remaining 72% (59/82) specific diagnosis could not be made. Sixty-five percent (15/23) of patients with a specific diagnosis had infectious etiology and the remaining 35% (8/23) were non-infectious. Herpes simplex was the commonest infectious etiology 46.6% (7/15) followed by toxoplasmosis 26.6% (4/15). Herpes simplex was the causative agent in 15% of anterior uveitis and toxoplasmosis was diagnosed in 50% of posterior uveitis (Table 1).

Eighty seven eyes (83%) had at least one complication and cataract was the commonest complication diagnosed in 47 (45%) eyes followed by ocular hypertension seen in 13% (14/105) eyes.14 eyes had intraocular pressure greater than 20 mmHg from which 6 eyes had IOP more than 30 mmHg (Table 2).

Discussion
The mean age of uveitis patients in this study was 33.8 ± 14.8 years and 50% of the patients were in the age range between 19 and 39 years. This is similar with the study done in china where the mean age was 33.8 ± 16.5 years and 60% are in the age range between 25 and 44 years,18 and studies done in
North India, Tunisia and Turkey which reported mean age 34.4, 34, 35.7 years respectively.

There was a higher percentage of males, 65%, in this study which was also the case in South India 62.2%, North India 52%, and China 52%. Factors contributing to male predominance in uveitis surveys reported from developing countries are undoubtedly complex and it was suggested that men tend to seek medical attention more often than women in agricultural societies and this may certainly have contributed to the trend in our clinic. In contrary females were predominant in the studies done in the United States, England, Thailand and Tunisia.

Anterior uveitis has been found to be the predominant type of uveitis by a number of investigators. This study also showed that anterior uveitis was the commonest type seen in 57% of patients. Studies carried out in China, Turkey, Thailand, North India and Tunisia also reported anterior uveitis to be the commonest type of uveitis in their studies. A population based study done in urban South India showed intermediate uveitis was the commonest type of uveitis. However, studies from Los Angeles California and Washington University in United States of America showed that posterior uveitis was the commonest type accounting for 38.4% and 48.4% respectively followed by anterior uveitis, pan uveitis and intermediate uveitis. A study from England showed that pan uveitis was the commonest in their series accounting for 47% followed by anterior, intermediate and posterior uveitis.

Our study showed a sudden onset of the disease was reported in only 32% of the study population while 68% presented with insidious onset. However, a study done in Washington University had a higher percentage of patients with sudden disease onset, 55%, while 45% presented with insidious onset of presentation.

Table 1. Frequency distribution by etiology of uveitis in patients presented to University of Gondar tertiary eye care and training center, NW Ethiopia (n = 82).

| Etiology                      | Anterior Uveitis | Intermediate Uveitis | Posterior Uveitis | Panuveitis |
|-------------------------------|------------------|----------------------|-------------------|-----------|
| Unknown Etiology              | 39               | 16                   | 1                 | 3         |
| Herpes simples uveits         | 7                | -                    | -                 | -         |
| Toxoplasmosis                 | -                | -                    | 4                 | -         |
| Syphilitic uveits             | -                | -                    | -                 | 1         |
| Tuberculosis uveits           | -                | -                    | -                 | 1         |
| Acute retinal necrosis        | -                | -                    | 1                 | -         |
| CMV Retinitis                 | -                | -                    | 1                 | -         |
| Vogt Koyanagi Harada syndrome | -                | -                    | -                 | 3         |
| Eale's disease                | -                | -                    | -                 | -         |
| Sympathetic Ophthalmitis      | -                | -                    | -                 | 1         |
| Multiple sclerosis            | -                | -                    | -                 | -         |
| Sarcoidosis                   | -                | -                    | -                 | 1         |
| Juvenile Rheumatoid arthritis | 1                | -                    | -                 | -         |
This study showed a higher percentage of unilateral disease (72%) and a lower percentage of bilateral disease (28%) than those of other series. A study done in Tunisia showed unilateral disease was the commonest accounting for 59.7% of patients which is similar with our result.14 However, a study done in England showed a higher number of bilateral uveitis 66% than unilateral uveitis 34%.7

In this study 23% of the study population had bilateral blindness which is greater than a study done in England 11.4%,9 Thailand 7.2%,20 and Tunisia 3.4%.14 This study has also showed 63% of involved eyes were blind and this is much higher than reports from Nepal (23%) 22, Tunisia (12.5%),14 England (11.5%).12 The high prevalence of secondary complications such as cataract in our patients (45%) and delayed presentation (61%) may be the reasons for the significantly higher vision loss.

Specific diagnosis was established in only 28% of our patients which is lower than reports from Thailand (56%),21 Tunisia (64.8%)14 and Nepal (36.7%).22 This may be due to limitations in the available laboratory tests in our center.

Herpes simplex was the commonest infectious etiology identified followed by toxoplasmosis and this is in line with similar studies.13,22,23

We have compared the results of our study with a study done in Jimma, Ethiopia, and found out that the age and sex distribution of uveitis is similar in both studies. Similarly, anterior uveitis and unilateral disease were also the most common presenting features of uveitis in both studies. However, Intermediate uveitis was the second most common type of uveitis in our study and the least common type of uveitis in the Jimma, Ethiopia, study.23

There is high prevalence of vision loss in eyes involved with uveitis in the Jimma study24 where 68.4% of eyes had visual acuity in the blindness category. This finding is also comparable to our study where 63% of involved eyes were blind. Unlike the jimma study,23 our study has data on the level of bilateral blindness among study patients and we found out that 23% of our patients were blind bilaterally. The high prevalence of cataract in both studies is the likely reason for the observed high blindness rate.

The percentage of cases where a specific diagnosis was made is very small in both studies and shows the limitations of the diagnostic capabilities of both set ups.

The commonest complication of uveitis among our study population was cataract, 45%, followed by ocular hypertension. Similarly, cataract was the commonest complication of uveitis in other studies done in England,9 Thailand21 and Jimma Ethiopia23 but cystoid macular edema was the second most common complication in England9 and the commonest complication in Tunisia.14 Cystoid macular edema was lower in our study probably because of lack of imaging modalities like optical coherence tomography and fluorescein angiography for diagnosis.

Uveitic glaucoma evidenced by glaucomatous optic nerve damage was found in 3% of our study patients but it was higher in the study done in Thailand 23%.24

The small sample size and limitations in the available laboratory tests to reach at an etiologic diagnosis are limitations of our study.

Conclusion
This study has identified Anterior Uveitis to be the commonest type of uveitis followed by intermediate uveitis, pan uveitis and posterior uveitis. There was a high prevalence of visual impairment and blindness among eyes involved with uveitis and 23% of our study patients had bilateral blindness. Herpes simplex was the commonest infectious agent identified followed by toxoplasmosis. The commonest complication was cataract followed by ocular hypertension.

Authors’ contributions
Both LS and AT were involved in all components of the research process including data collection, review of literature, manuscript writing and statistical analysis. Both authors read and approved the final manuscript.

Data availability
All data are fully available without restriction

Declaration of interest
The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

Funding
Authors received no specific grant for this study

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