

# Knowledge, Attitude and Practice on Ocular Tuberculosis and Sarcoidosis Amongst Chest Physicians in Chitwan, Nepal

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## ABSTRACT

### Background

Tuberculosis (TB) is considered an endemic disease in Nepal with predominantly chest related signs and symptoms. Sarcoidosis is a disease with similar clinical presentation. This study was conducted to find level of knowledge, attitude and practice among physicians, cardiologists, pulmonologists and internists regarding the ocular manifestations of these diseases.

### Methods

A descriptive cross-sectional study among the participating physician, cardiologists, pulmonologists and internal medicine practitioners of a Continuing Medical Education (CME) program which was organized to raise awareness regarding ocular tuberculosis and sarcoidosis. A novel questionnaire with 20 items divided into three sections was developed. 40 respondents were included. The questionnaire was validated and pretested by both ophthalmologists and internal medicine practitioners. Data was analyzed by using SPSS-20 using descriptive statistical tools. 95% confidence interval was calculated to estimate the level of good knowledge, attitude and practice amongst the participants.

### Results

This research was conducted among 40 practitioners. The level of good knowledge was found to be 17.5% (With 95% CI as 7.34% to 32.78, good attitude was found to be 80.5% (With 95% CI as 65.5% to 90.5%) and level of good practice was found to be 19.5% (With 95% CI as 9.05% to 35.65%).

### Conclusions

This research showed that the level of knowledge and practice of the respondents was poor while the level of attitude was found to be good. It is necessary to raise awareness amongst treating chest physicians regarding the ocular features of TB and Sarcoidosis so that adequate systemic treatment may be initiated and sight threatening complications do not occur.

**Keywords:** tuberculosis; sarcoidosis; ocular manifestations; treatment; sight-threatening complications.

## INTRODUCTION

Tuberculosis is a major public health problem in Nepal. TB case notification, as well as estimated incidence, has been stagnant for more than decades now in Nepal (CNR 152/100,000 in 2018) despite best efforts to find and cure more TB cases.<sup>1</sup> It is well known that it may have life threatening complications, some including chest complications, neurological

complications and abdominal complications.<sup>2</sup> With an almost similar picture, systemic sarcoidosis is also known to have grave consequences in the pulmonary, cardiac and neurological front.<sup>3</sup> The internal medicine practitioners, pulmonologists and cardiologists are at the forefront in the treatment of these diseases and must be made aware that these diseases also have ocular manifestations and also that

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sarcoidosis is common in Nepal.<sup>4</sup> Ocular involvement in tuberculosis and sarcoidosis has been less studied in Nepal. Multiple studies done in tertiary eye centers have reported occurrence of TB uveitis to be 2.3-4% and that of sarcoid uveitis to be 1.2-1.7% among the total uveitis and scleritis cases. TB was reported as the third most common infective ocular uveitis and the single most common systemic bacterial disease-causing uveitis. Sarcoidosis was the 3<sup>rd</sup> most common non-infectious systemic disease affecting the eye.<sup>5,6,7</sup> As these are not emphasized upon as adequately as should be in the internal medicine faculty, there have been instances where the treating ophthalmologist's diagnosis of ocular tuberculosis or sarcoidosis has been refuted by the treating internal medicine specialist. Also, the awareness of patients' regarding ocular involvement in these systemic diseases and even the ocular toxicity in the systemic treatment of these disease has been a subject of neglect. Hence, patients under anti-tubercular therapy are not frequent in seeking care from ophthalmology department. We found this an important subject requiring special attention hence this KAP study was conducted as a part of an academic session emphasizing the importance of the topic amongst ophthalmologists and internal medicine specialists.

## METHODS

This was a cross-sectional study among the participating physicians, cardiologists, pulmonologists and internal medicine practitioners of a Continuing Medical Education (CME) program which was organized to raise awareness regarding ocular tuberculosis and sarcoidosis. It was conducted after taking institutional approval from Bharatpur eye hospital. This research is based on a novel Knowledge, Attitude and Practice (KAP) questionnaire which was formulated with basic internal medicine and ophthalmology linked topics regarding both systemic TB and Sarcoidosis and TB and Sarcoidosis in the eye. The questionnaire contained 20 items divided into three sections where knowledge section had 8 questions, attitude section had 5 statements and practice section had 7 questions. The answering

physicians, cardiopulmonary specialists were kept anonymous except questions pertaining to their number of years of clinical practice in the field. Major focus was laid upon treatment of tuberculosis in the eye including the standard duration of treatment and monitoring of ocular toxicity of anti-tubercular drugs (ATT therapy). The use of immunomodulators in the treatment regimen was another topic emphasized. Pre testing was done amongst the internal medicine faculty for reliability analysis while for validity, questionnaire was discussed with experts in uveitis and scleritis as well as by internal medicine experts including cardiologists and pulmonologists. The KAP questionnaire is attached below for reference. Data was then collected by using validated questionnaire. Collected data was then coded with serial number and then entered in Microsoft excel. Data was analyzed by using SPSS-20 using descriptive statistical tools. In the descriptive statistics for the categorical variable frequency and percentage were calculated and then data was presented using pie chart and bar diagram while for continuous variable mean and standard deviation was calculated. Also 95% confidence interval were calculated to estimate the level of knowledge, attitude and practice in participant doctors.

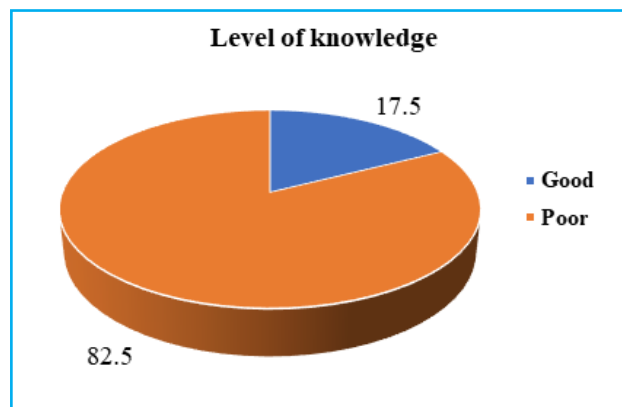
## RESULTS

There were 40 practitioners in the study and the response rate was 100%. There were 62.5% internal medicine residents, 20% were medical officers, 7.5% were consultant internal medicine practitioners, 7.5% were cardiologists and 2.5% were pulmonologists in the study, 80% participants had been involved in the active treatment and care of patients for 0-5 years, 7.5% for 5-10 years, 2.5% for 10-15 years and 7.5% practitioners had been involved in active treatment of tuberculosis and sarcoidosis patients for more than 15 years. Eighty-five percent practitioners treated less than 10 patients with tuberculosis and/or sarcoidosis annually whereas 12.5% treated 10-20 patients annually and only 2.5% practitioners treated more than 20 patients on an annual basis. Nine

<b>Table 1. Characteristics of the respondents. (n=40)</b>	
<b>Characteristics</b>	<b>Frequency (%)</b>
<b>Respondents</b>	
Internal medicine residents	25(62.5)
Medical officers	8(20)
Internal medicine practitioners	3(7.5)
Cardiologists	3(7.5)
Pulmonologist	1(2.5)
<b>Involved in the active treatment</b>	
Yes	32(80)
No	8(20)
<b>Duration of involvement</b>	
0-5 years	32(80)
5-10 years	3(7.5)
10-15 years	1(2.5)
>15 years	3(7.5)
Unanswered	
<b>Duration of treatment</b>	
<10 patients	34(85)
10-20	5(12.5)
>20	1(2.5)
<b>Seeing any referral case</b>	
Yes	9(22.5)
No	25(62.5)
Would choose to consult	4(10)
Unanswered	2(5)

<b>Table 2. Knowledge on each question. (n=40)</b>	
<b>Questions</b>	<b>Frequency (%)</b>
Part of the eye affected by tuberculosis	31(77.5)
Retinal vasculitis is present in tuberculosis patients	31(77.5)
Guidelines of Nepal on tuberculosis on Mantoux	23(57.5)
Next step of physician negates a Mantoux positive patients' diagnosis of ocular TB on the basis of negative sputum results	30(75)
Biological marker for sarcoidosis according to revised IWOS	23(57.5)
X-ray finding refutes the need for further radiological testing in suspected ocular sarcoidosis	33(82.5)
Features that increase suspicion for sarcoid anterior uveitis	32(80)
Most definitive diagnostic test for sarcoidosis by IWOS	33(82.5)

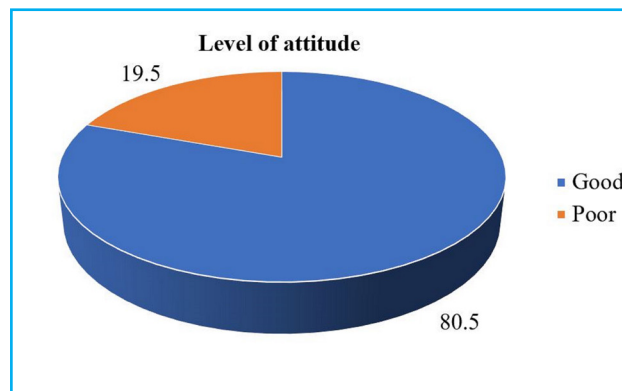
practitioners were actively managing patients of suspected ocular tuberculosis and/or sarcoidosis referred by uveitis specialist in their clinical practice whereas 62.5% were not seeing any referral, 10% practitioners would choose to consult an expert by phone and 5% practitioners found it uncomfortable to answer this question (Table 1). The knowledge of the participants in general was good however, only 7 participants were able to get all knowledge based questions correct (Table 2). Thus, the level of good knowledge was found to be only 17.5% (With 95% CI as 7.34% to 32.78%) (Figure 1).



**Figure 1. Level of knowledge. (n=40)**

Table 3 extrapolates the attitude segment of the questionnaire as statements that the participants either agreed, remained neutral to, or disagreed. The level of good attitude was found to be 80.5% (With 95% CI as 65.5% to 90.5%) (Figure 2).

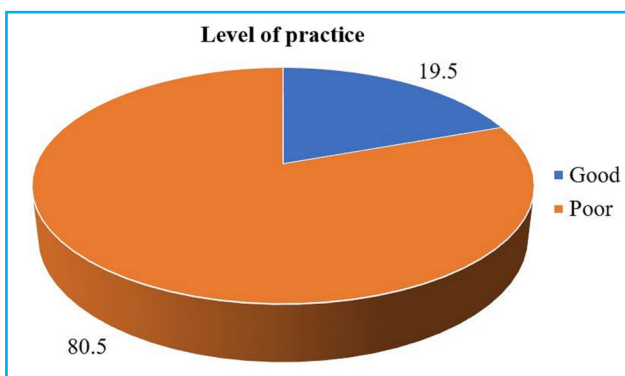
The level of good practice was found to be 19.5%



**Figure 2. Level of attitude. (n=40)**

(With 95% CI as 9.05% to 35.65%) (Figure 3).

Attitude	Agree	Neutral	Disagree
Systemic sarcoidosis patients' needs to refer to ophthalmologist	31(77.5)	7(17.5)	2(5)
Patient treated with ATT refer to ophthalmologist for screening ocular tuberculosis	27(67.5)	11(27.5)	2(5)
Patients before starting ATT needs a baseline and periodic ocular examination including optic nerve function tests	33(82.5)	4(10)	3(7.5)
Ocular tuberculosis/sarcoidosis has vision threatening complications	39(97.5)		1(2.5)
Immunomodulators along with ATT can start in ocular tuberculosis	21(52.5)	11(27.5)	8(20)



**Figure 3. Level of practice. (n=40)**

## DISCUSSION

Tuberculosis (TB) which was historically considered a death sentence and has now for long been made conquerable by judicious drug treatment is still one of the top 10 causes of death and the leading cause of death by a single infectious agent (above HIV/AIDS). Millions of people continue to fall sick with TB each year. In the year 2017 itself, nearly 10 million population worldwide developed TB and caused an estimated 1.3 million deaths (including 0.3 million among people

Response on each question of practice	Frequency (%)
<b>Duration of Anti-tubercular therapy recommended for ocular tuberculosis</b>	
6 months	28(70)
9 months	11(27.5)
Depends on other factors	1(2.5)
<b>Oral steroids can be started in patients with ocular tuberculosis</b>	
Before starting of ATT	14(35)
At the same time as ATT commencement	14(35)
Only after starting of ATT	9(22.5)
Doesn't matter	3(7.5)
<b>Counselling of a patient with ocular sarcoidosis</b>	
The disease course is unpredictable	2(5)
You will be cured after one attack and treatment	1(2.5)
You may need long course of treatment	4(10)
The disease course is unpredictable and you may need a long course of treatment	33(82.5)
<b>Confident to start ATT on patient of TB uveitis referred by a uveitis specialist</b>	
Yes	13(32.5)
No	3(7.5)
Needs further investigation	19(47.5)
Will consult an expert	5(12.5)
<b>Recommendation for toxicity of oral immunomodulators therapy (IMT) for treatment of uveitis</b>	
Completely stop IMT	19(47.5)
Decrease dose of IMT	11(27.5)
Supportive treatment at same dose	3(7.5)
Change the IMT	7(17.5)
<b>Managing a patient on IMT in absence of rheumatologist</b>	
Confident	8(20)
Not confident	2(5)
Not sure	30(75)
<b>Managing patients of suspected ocular TB or sarcoidosis sent to you for systemic evaluation for uveitis</b>	
Yes	9(22.5)
No	25(62.5)
Will consult rheumatologist/expert by phone	4(10)
Rather not answer	2(5)

with HIV) in the same year, making TB one of the leading cause of deaths for HIV-positive people. Even though HIV is said to significantly contribute to TB remaining a major cause of morbidity, only 9% affected were people living with HIV. South East Asia Region alone holds nearly 45 % of global TB cases.<sup>1</sup>

Tuberculosis is an ongoing epidemic and a major health problem in Nepal as shown by the data published in 2019 which stated that in 2017/18, a total of 32,474 new cases of TB were notified and registered. Nepal targets to significantly decrease the TB case load by 2035 as per the sustainable development goals (SDG) and completely eradicate the disease by the year 2050. This is Herculean task nonetheless and with the advent of diseases like HIV/AIDS, the stakes are high. TB-HIV co-infection rate in Nepal is 1.1% (HIV among TB) and 8.5% (TB among HIV) based on the sentinel survey, 2013. A disease with very similar clinical features and a close mimicker of tuberculosis, both systemically as well as ophthalmologically, has been sarcoidosis. As the rates of Sarcoidosis were reported to be increasing in India which is the neighbor of Nepal and shares similar demographic profile, a study was done in Nepal which postulated sarcoidosis to be common in Nepal too.<sup>4,8-12</sup> The lack of identification of a specific inciting antigen have established it as a mysterious disease and hence it has been established as a disease of rare occurrence. It is often a diagnosis of exclusion more than not. We are well aware as also stated by the national TB data, that the total number of tuberculosis cases in the country is much more than reported as also those of undiagnosed tubercular uveitis. There is also a diagnostic and treatment dilemma regarding ocular tuberculosis in the treating physicians to whom we refer for further management. This study was initiated to sensitize physicians regarding this scenario and also to bridge the gap between the physicians and the ophthalmologists regarding referral patterns of tubercular and sarcoid uveitis. Ocular tuberculosis accounted for 4% of the total uveitis and scleritis cases throughout Nepal as evidenced by an epidemiological study published in the year 2017 where all uveitis cases (total 1221) were analyzed over 1 year.<sup>5</sup> Another study from Nepal reported ocular tuberculosis to be the cause of 2.32% of cases over a total 5-year study duration (total 4359 uveitis cases).<sup>6</sup> In another study conducted at a tertiary eye center in Nepal, systemic association of uveitis was studied where 308 cases from November 2008 to April 2010 were included. This study reported Tuberculosis to be the cause of uveitis in 3.6% (11

cases) and sarcoidosis to be the cause of 1.6% cases (5 eyes).<sup>7</sup> The incidence of ocular sarcoidosis has been reported as 1.7% and 1.2% respectively by the above studies, with the predominant presentation being that of panuveitis.<sup>5-7</sup> Often a diagnostic confusion exists from the ophthalmologists' side when treating a suspicious uveitis. Hence corroborative evidence is sought from the internal medicine specialist, a pulmonologist if available. This was the highlight of the above study where the collaboration for the diagnosis of ocular involvement in systemic tuberculosis or sarcoidosis was targeted and the basic knowledge of the treating physicians, pulmonologists and cardiologists was sought. In the present study, the knowledge of the ocular manifestations of tuberculosis and sarcoidosis seemed fair with only 17.55% answered correctly and another 20 (50%) getting more than 70% correct, 35% study participants were not able to get more than a 50% score. It is of great importance that the internal medicine specialists are aware that any ocular structure from the eyelids to the retina and retinal blood vessels may be involved in ocular tuberculosis and may account for recurrent ocular morbidity affecting the quality of life. Also, the practitioners must be well versed in the national guidelines for tuberculosis diagnosis and understand that ocular tuberculosis is a form of extrapulmonary tuberculosis hence a sputum negative patient must not be denied Anti-Tuberculosis Treatment (ATT) if the Mantoux test is positive and there is strong clinical suspicion on the part of the treating ophthalmologist. When considering sarcoidosis, it is often taken for granted from the ophthalmologists' perspective that the serological markers of ACE (Angiotensin Converting Enzyme), Lysozyme and serum Calcium are well known to the physicians. However, this didn't seem the case by the above study where only 23 of 40 (58%) physicians were aware that all 3 were the biomarkers and were included in the IWOS guidelines. The simplest radiological sign pointing to sarcoidosis being bilateral hilar lymphadenopathy was known to 33 of 40 (83%) respondents and bilaterality and granulomatous ocular disease were found to be known manifestations of ocular sarcoidosis by (80%) respondents. Most



respondents were aware that biopsy of involved tissue was the definitive test required for diagnosis of ocular sarcoidosis (33/40). It appeared that majority of internal medicine practitioners were well versed in the diagnosis of systemic sarcoidosis as well as ocular sarcoidosis. The uveitis specialist would be able to refer a case of bilateral granulomatous uveitis knowing that one of the differentials in the mind of the treating internal medicine practitioner would be ocular sarcoidosis. This is a paradigm shift considering sarcoidosis was previously considered rare in our country. In this study, the attitude of the physicians was also tested as regards to the two diseases and their ocular manifestations. Most participants (80.5%) demonstrated good attitude regarding ocular tuberculosis and sarcoidosis management. Most respondents, 78% (31/40) mentioned that they would like to refer all patients diagnosed with systemic sarcoidosis to the ophthalmologist. From the ophthalmologists' viewpoint, this could be controversial as ocular sarcoidosis is known to occur in systemic sarcoidosis in 20-50% cases.<sup>13-16</sup> Also, any systemic immunotherapy, including steroids may be used to treat the ocular manifestations by default. However, as the disease course is unpredictable, any recurrence could be identified by the patient him/herself by proper counseling and vision threatening complications can be avoided. A majority (67.5%) would also similarly like to refer all patients being treated with ATT for systemic tuberculosis for unidentified ocular manifestations. The same situation would hold in this scenario with the scenario of recurrence being somewhat lowered but undeniable due to chances of insidious disease and peripheral involvement, 78% agreed that all patients under ATT would require baseline and periodic ocular examinations to screen for ocular toxicity of ATT. The mass majority, 98% of respondents were aware that both tuberculosis and sarcoidosis may have vision threatening complications and would counsel the patients accordingly. Also, 52.5% respondents were aware that immunomodulators could be used in conjunction with ATT whereas 8 (20%) wouldn't use ATT in conjunction with ATT and 10 (25%) respondents were unsure. As ophthalmologists, we consider that

ATT can be used in conjunction with immunomodulators if control of the inflammation is inadequate or there is need of prolonged systemic steroids to control the inflammatory process. The practice of the internal medicine faculty regarding tuberculosis and sarcoidosis was tested with 7 questions. Only 9 (23%) practitioners stated they were actively treating ocular tuberculosis and ocular sarcoidosis patients independently and 4 (10%) would consult experts for opinion on how to manage such cases. 80.5% had poor practice in terms of treatment of ocular tuberculosis and sarcoidosis. It thus appeared important to impart knowledge about the expectations of ophthalmologists, in particular, uveitis specialists in terms of treatment strategies of ocular TB and sarcoidosis. When asked the treatment duration required for ocular tuberculosis, a majority 70% respondents were aware that a treatment course of 6 months was required. There is still a controversy regarding the exact treatment duration of ATT for ocular Tuberculosis. However, the common denominator remains that a minimum of 6 months is mandatory and the category is that of extrapulmonary TB. When questioned about simultaneous therapy with steroids in addition to ATT, 14 (35%) physicians were comfortable prescribing oral steroids before the commencement of ATT whereas another 14 (35%) would start at the same time as they started ATT. Another 9 (23%) would start later and 2 (5%) stated it wouldn't matter. Theoretically, it is stated that it doesn't matter however, we as ophthalmologists are comfortable with starting oral steroids later than ATT and only if vision threatening circumstances arise. As another question, the respondents were asked if they were comfortable starting ATT on any patient suspected of ocular tuberculosis. To which 13 stated they would themselves start ATT without hesitation whereas 9 (23%) would require further testing besides the clinical signs and a positive Mantoux test. 3 (8%) stated they would not start ATT just on the suspicion of the ophthalmologist and 5 (13%) would consult an expert before starting a long-term treatment such as ATT. Our expectation as uveitis specialists is that internal medicine specialist aid in gaining the patient's confidence in treatment with ATT when required and manage systemic complications

of therapy as and when they occur. As a practice-based question on ocular sarcoidosis, internal medicine experts were asked how they would counsel patients diagnosed with ocular sarcoidosis. The vast majority (78%) would counsel patients by stating that the disease has both an unpredictable course and that long term therapy may be required for the treatment. This is what has been known to us through the literature and hence would be a great support in the treatment and counselling of patients with ocular sarcoidosis. It was found that the research participants were not very comfortable in the treatment of uveitis with immunomodulators. Uveitis specialists in this region have reservations in the use of these drugs as they require systemic backup to monitor drug toxicity. In this regard, practitioners were asked how they would manage systemic toxicity in patients already on immunomodulators. 9 (23%) respondents would abruptly stop the drug, 11 (28%) would decrease the dose of the drug, 3 (8%) would continue the same dose with other supportive treatment and keep the patient under close observation and 6 (15%) would change the immunomodulator. As uveitis specialists, it would be best for the control of disease if the drug dosage could be decreased with or without adjuvant supportive therapy while under constant monitoring. Another option could be change of therapy. The control of ocular disease with minimized systemic toxicity being the common goal from both the ophthalmologists and internal medicine side. As a continuation, the respondents were asked if they were confident in the use of immunomodulators in the absence of a rheumatologist. Only 8 of 40 (20%) stated they were

confident to prescribe and monitor the use of immunomodulators independently. This is lower than anticipated figure considering the patients choose their doctors and hospitals. Also, the government insurance scheme limits the access of the low-income general public to government hospitals which may lack rheumatologist or laboratory facilities to perform advanced investigations.

## CONCLUSIONS

This research showed that the level of knowledge and practice of the respondents was found to be poor while the level of attitude was found to be good. Ocular tuberculosis and sarcoidosis have been topics in the shadow of many other diseases for internal medicine practitioners in this region. It is necessary to impart and reinforce knowledge to the practitioners regarding diagnosis, management and expectations of ophthalmologists during referral. The use of immunomodulators in uveitis has been another topic that deserves attention. A proper channel for referral must be established for the benefit of both the group; the patient and the treating health personnel.

## ACKNOWLEDGEMENT

The authors would like to appreciate the help of Assoc. Prof. Dr. Anu Manandhar, Prof. Gyanendra Lamichchhane, for help in validation of the KAP questionnaire and residents and staff of Bharatpur Eye hospital in the collection of data. Also, sincere gratitude to all participants of the study for the enthusiastic participation.

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**Citation:** Subedi Kumudini, Laudari Shankar, Subedi Ashish, Pradhan Sangita, S Dulal, Upadhyay HP. Knowledge, Attitude and Practice on Ocular Tuberculosis and Sarcoidosis Amongst Chest Physicians in Chitwan, Nepal. *JCMS Nepal*. 2024; 20(1): 95-102.