DISCUSSION
DISCUSSION

The present endeavour has been based on a study of ocular problems and their management in paediatric patients of Bundelkhand Region including 63 patients of TB. The study was conducted at R.L.B. Medical College, Jhansi between July 1983 to May, 1984.

The primary aim of our study was to find out the prevalence of ocular lesions of tuberculous meningitis in paediatric patients of Bundelkhand Region, to decide the prognosis of disease and to prevent the dreaded sequelae of blindness by early detection of complications and their management. With these objectives in view, a detailed ophthalmoscopic study was carried out and various associated factors influencing prognosis of the disease were studied in detail in each case. Management and follow up study was carried in each case having ocular lesion. Statistical analysis was done where ever needed.

Based on observations depicted in table I to XVI, various inferences have been drawn and discussed under different headings.

Prevalence of ocular lesions:

The majority of our cases of TB belonged to group 0-4 years of age (preschool children). The incidence in this age group was 80.95%. There was preponderance of male cases over female cases in this study. Out of total 63 cases the female cases in this study were only 12 (19.05%).
in number. Rao (1972) described that in patient statistics from children's medical wards of hospitals in different parts of India reveal that TB cases from 1-4% of the total pediatric medical admission and majority of cases are encountered in the preschool age group because of exposure to infection in infants and young children in developing countries. The preponderance of male cases over female cases in our study is suggestive that parents are more health conscious for the male children in our community, they are readily taken to the hospital for consultation resulting in an apparently higher incidence in males.

The ocular prevalence in our study observed was 85.71%. Similar results were in the past study viz. Isente Ivan (1950) reported 95% ocular involvement and Hooney (1956) 72% ocular sequelae. In recent studies too, higher incidence of ocular lesions has been reported. Gupta (1976) reported 80% optic nerve involvement in paediatric patients of TB in Jhansi district. Verma et al (1981) observed 70% ocular prevalence. The reason for higher ocular prevalence is possible due to overcrowded living condition, low socio-economic status, malnutrition, ignorance, illiteracy, poverty and failure to get prompt and adequate therapy in the patients of Bundelkhand Region.

Clinical picture of the disease :-

The important signs & symptoms observed in this study were fever 85.71%, vomiting 58.72%, altered consciousness 62.55% and meningeal signs 76.16%, Nelson (1973)
in his text book of pediatrics have described the symptomatology in similar way, the important clinical features being fever, vomiting, altered sensorium, convulsions, meningeal signs, motor deficit, various cranial nerve paralysis and fundal changes.

Relationship of various ocular lesions and mortality to factors influencing the prognosis of disease.

Socioeconomic status - Majority of cases of II, III were from lower socio-economic class (Srivastava et al 1981 classification). The patients in class III, IV & V were 26.57%, 36.50%, and 23.81%, respectively. The ocular involvement in class III & IV was 83.33% & 93.30% respectively whereas in class V all cases were showing ocular involvement.

Nutritional status - Most of the cases in this study were having poor nutritional status (84.13%). In poor nutritional group ocular prevalence was 94.33% in comparison to fair nutritional status group i.e., 40% only, it is much higher. The mortality in poor nutritional status group was 25.39% where as in other group, there was no death. Statistical analysis revealed high significance between the two groups (t 61 d.f. = 5.4; p < 0.001).

Stage of disease - The cases in this study were mainly in stage II & III of the disease. Only 8 cases (12.69%) were in stage I. The ocular prevalence in stage II & III was
91.66% and 93.34% respectively whereas it was only 37.51% in stage I. The mortality was highest among stage III patients. The statistical analysis revealed high significance between ocular changes in stage I & II and stage I & III (Stage I & II t 30 d.f.=3.857; p \leq 0.001 /Stage I & III t 37 d.f.=5.6 p \leq 0.001).

Duration of illness—duration of illness was divided in 3 groups in this study Group I (duration of illness \leq 1 month), Group II (duration of illness 1-6 months), and Group III (duration of illness 7-6 months). It was noted that ocular prevalence in group I & II was 53.33% and 94.59%, whereas in group III all the cases were having ocular involvement. This inferred that neurological damage is directly proportional to the duration of illness. Statistical analysis revealed significance between group I & II and group I & III (Group I & II t 50 d.f. = 4.55; p \leq 0.001) Group I & III t 24 d.f. = 3.133; p \leq 0.01). Dikshit & Singh (1976) reported similar inferences regarding various factors influencing prognosis of tuberculous meningitis. It was observed in their study that mortality & morbidity was highest if the child was less than 3 years of age, in III stage of disease (MRC classification), malnourished, belonged to low socio-economic group, ill for more than 9 months. In their study poor nutritional cases were having 59% neurological damage in comparison to 29% only in fair nutritional group.
There was 41.7%, 35% and 37.5% morbidity in low socio-economic groups of III, IV & V respectively, when duration of illness was less, the damage was 35.70%, while it increased to 67.50% when it was more than 1 month.

Ocular problems:

Cranial nerve palsies- In this series cranial nerve involvement was observed in 42.85% cases. The various cranial nerves involved were VII (Facial nerve), III (oculomotor nerve) and VI (abducent nerve) in order of frequency. The incidence of these nerves was facial nerve in 19.04% cases, oculomotor nerve in 12.69% cases and abducent nerve in 11.11% cases. Out of 8 cases of oculomotor nerve 7 cases showed unilateral involvement whereas one case showed bilateral involvement. Similarly out of 7 cases of abducent nerve 5 cases having unilateral involvement & 2 cases bilateral. In contrast to oculomotor and abducent nerves, facial nerve involvement was seen unilaterally in all the cases. Saxena and Tomar (1970) reported similar findings. The incidence of cranial nerve palsies in their series was 47%. Out of these 47%, facial nerves palsy was seen in 23.5% cases where as oculomotor and abducent nerves were involved in 11.7% cases each. Thaper et al (1968) have reported low incidence of cranial nerve palsies i.e., 17% only (8% facial, 5% abducent and 4% oculomotor).

Bhatnagar & Srivastava (1961) suggested that the paralysis of ocular muscles results from infiltration of III and VI nerves at the base of brain, hence blindness.
VI nerve palsy may result from raised intracranial tension.

Pupillary abnormalities:

The prevalence of pupillary abnormalities in this series was 68.25%. Out of these total pupillary abnormalities dilated & fixed pupils were noted in 41.26% cases. Among them 20 cases were having bilateral involvement whereas unilateral involvement was noted only in 6 cases. Moderately dilated with sluggish reactions of pupil was observed in 26.98% cases. Out of total 17 such cases, 12 cases showed bilateral involvement. Similarly Desai & Ankelsaria (1967) reported the various pupillary abnormalities in 63.82% cases. Khatua (1961) reported a much higher incidence of pupillary abnormalities in the cases that was 76% whereas Misra & Gupta (1962) reported pupillary abnormalities in 25% cases only.

Walsh (1957) suggested the dilated & fixed pupils were seen in those cases in which optic atrophy had been set up. These pupils may also be due to cerebral irritation by raised intracranial tension.

Anterior segment lesions:

The ocular prevalence for anterior segment lesions in this series was very low only 4.76% cases had conjunctivitis and 3.17 had corneal ulcer. Verma et al (1981) reported similar results. They reported 6% cases of corneal ulcer and conjunctivitis each. Many other workers in the field have however reported no anterior segment lesions. It is postulated that conjunctivitis may be due to allergy. Infection and corneal ulcer may result from exposure.
keratitis. These lesions may be due to poor body resistance and neglected eye care.

Fundoscopic lesions:

The ocular prevalence of various fundoscopic lesions viz. papilloedema, papillitis, optic atrophy, bitemporal pallor and pale disc, was 80.95% in this series. Desai & Ankelsaria reported similar fundus changes that was in 74.46% cases. Bhatnagar and Srivastava (1961) reported 43.3% optic nerve involvement only.

Papillitis and papilloedema:

In this series papillitis was observed in 19.05% cases. Out of total 12 cases of papillitis, 4 case showed unilateral involvement where as 8 cases showed bilateral involvement. Papilloedema showed higher incidence in comparison to papillitis. It was observed in 25.39% cases. Out of total 16 cases of papilloedema 13 cases showed bilateral involvement. Mooney (1956) reported papilloedema in 26% cases and retrobulbar neuritis in 3.1% cases only.

Bhatnagar & Srivastava (1961), reported a higher incidence of papilloedema & papillitis viz 16.6% & 13.3% respectively. Similarly Misra & Gupta (1962) reported higher incidence of papillitis (35%) in comparison to papilloedema (7.5%).

Mooney (1956) suggested that the pathology in reversible papilloedema was external hydrocephalus where as in progressive papilloedema the cause is tuberculous arachnoiditis which in turn interferes with the circulation of CSF...
Pathologic process of papillitis is supposed to be optico-chiasmatic arachnoiditis.

Optic atrophy :-

The prevalence of optic atrophy in this series was 31.74%. Saxena & Tomar (1970) reported optic atrophy in 29.1% cases similarly. The optic atrophy observed in this series was grouped in 2 forms.

I- Primary optic atrophy :-

The primary optic atrophy was seen only in 6.34% cases. All the cases were having bilateral involvement. Saxena & Tomar (1970) reported 12.7% primary optic atrophy. Cases Lothe et al (1972) reported a higher incidence of primary optic atrophy that was 56%. Verma et al (1981) stated that optic atrophy may be due to internal hydrocephalus of third ventricle causing pressure on optic Chiasma.

II- Post neuritic optic atrophy - It was observed in 25.39% cases out of 16 cases 10 cases were having bilateral involvement. Verma et al (1981) reported post neuritic atrophy in 12% cases.

Post neuritic atrophy observed in this series was supposed mainly due to preceding papilloedema or papillitis.

Bitemporal pallor :- It was reported in 3.17% cases. Dassi & Ankelsaria (1967) reported bitemporal pallor in 4.2% cases and suggested that it may be due to compression type of lesion at the level of chiasma. Verma et al (1981) reported bitemporal pallor in 10% cases.
Paledisc - It was seen only in 1 case (1.58%) having unilateral involvement Desai & Ankalsaria (1967) suggested that the pale disc is suggestive of reduction in blood supply to optic nerve. Only Desai & Ankalsaria reported Paledisc (12.76%) lesion in the field of ocular manifestations of THM.

Management & Follow up study of ocular lesions:

Cranial nerve involvement - Out of total 12 cases in which facial nerve was involved, 2 cases left against medical advice. In remaining 10 cases 30% expired 60% cases recovered totally and 10% partially.

In abducent palsy out of 7 cases 28.57% expired, 42.65% having unilateral involvement recovered totally where as 28.57% cases - having bilateral involvement recovered partially. In 8 cases of oculomotor nerve palsy, 1 case left against medical advise. Out of remaining 7 cases 14.29% expired and 71.42% cases - having unilateral nerve palsy recovered completely where as 14.29% cases- having bilateral involvement recovered partially.

Thus it is evident that in cranial nerve palsies recovery was almost complete. The mortality was high in facial nerve and abducent nerve palsy showing grave prognosis. Bhatnagar & Srivastava (1962) reported complete recovery in oculomotor nerve involvement where as 90% mortality was seen in abducent nerve involvement - Desai & Ankalsaria (1967) reported complete recovery in facial.
nerve palsy. Where as in oculomotor nerve palsy all cases having bilateral involvement 50% recovered partially & 50% completely. In case of sixth nerve, 16.66% cases recovered partially and 83.34% cases recovered completely. Verma et al (1981) reported that out of total oculomotor nerve palsy 16.6% expired where as in abducent nerve palsy mortality was 33.33%.

Pupillary abnormalities -

Out of 26 cases of dilated & fixed pupil 43.47% expired, 30.43% recovered and 26.08% cases remained same. The cases which remained same gives an idea that in these cases optic atrophy was set up which did not recover even after treatment. The mortality was high in dilated & fixed pupil cases. Verma et al (1981) also reported 25% mortality in dilated & fixed pupil.

Among 17 cases of moderately dilated pupil with sluggish reaction 13.33% expired, 60% recovered and 26.66% showed no recovery. Bhatnagar & Srivastava (1961) reported complete recovery in moderately dilated pupil with sluggish reaction. In our cases the cases which did not recover means that these cases were not relieved from optic nerve lesions even after treatment.

Anterior segment lesion - All the cases of conjunctivitis and corneal ulcer recovered after treatment. It infers than proper eye care is necessary during the course of disease to avoid anterior segment lesions.
Fundoscopic lesions –

Papilloedema & papillitis - Out of total 16 cases of papilloedema 50% cases expired which were having bilateral involvement, thus showing grave prognosis 31.25% cases recovered while 18.75% cases progressed to postnueritic atrophy. Among the 3 cases which progressed to post neuritic atrophy, 1 case recovered and 2 cases remained same. In 12 cases of papillitis 1 case left against medical advice and 27.27% cases expired, 63.63% cases recovered and 9.09% cases progressed cases progressed to optic atrophy which did not recover in follow up study. Thus it is evident that papillitis cases were having better prognosis in comparison to papilloedema. Desai & Ankelsaria (1967) reported that 50% cases of papilloedema recovered, 25% expired and 25% progressed to optic atrophy where as in papillitis 69.2% cases recovered, 23% cases expired and 7.69% cases progressed to post neuritic atrophy. Thus our findings very much simulates to Desai & Ankelsaria series. Verma et al (1981) reported 75% mortality in papilloedema and 33.33% in papillitis. Thus papilloedema is having grave prognosis. Post neuritic optic atrophy - Out of 20 cases of post neuritic optic atrophy, 2 cases left against medical advice, 35.71% expired, 42.85% recovered and 21.42% remained same.

Primary optic atrophy - Out of 4 cases of primary optic atrophy 1 case left against medical advice, 33.33% recovered and 66.66% remained same.

Bitemporal pallor & pallidus 20% cases of which 1 case left against medical advice.