MATERIAL AND METHODS
MAP OF BUNDELKHAND
REGION

Fig. 1
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The present study was carried out in the department of Ophthalmology, M.L.B. Medical College, Jhansi in active collaboration with the department of Paediatrics, over a period of 11 month from July, 1983 to May, 1984. Children, admitted to the paediatric ward, M.L.B. Medical College, Jhansi and diagnosed as cases of tuberculars meningitis were selected for this study. Children were of either sex and the age ranged from under 1 year to 13 years.

Sixty three children of tuberculous meningitis were studied for ocular manifestation and their management. These children admitted to the Paediatric ward of M.L.B. Medical College, Jhansi, belonged to Jhansi district and nearby districts of Uttar Pradesh and Madhya Pradesh forming the Bundelkhand Region.

The area of study, Bundelkhand Region which spreads over the states of Uttar Pradesh and Madhya Pradesh (Fig. 1), is located between 23°10' and 26°30' North Latitude and 78°21' and 81°40' East longitude. The region covers a total geographical area of 7000 Sq. Km. including eleven districts, five of which viz. Jhansi, Lalitpur, Jalaun, Hamirpur and Banda are in Uttar Pradesh and remaining six districts viz. Datia, Tikamgarh, Chhatarpur, Panna, Damoh and Sagar in Madhya Pradesh (Fig. 2).
The region represents a transitional zone of tropical dry subhumid in the east to tropical semiarid in the west. The overall mean annual temperature of the region is high and varies from 25 - 26°C.

METHOD:

Diagnosis of TBM:

The diagnosis of tuberculous meningitis in these children was based on clinical features and was confirmed by cerebrospinal fluid examination. Cerebrospinal fluid examination revealing increase in protein, moderate decrease in sugar content and pleocytosis varying from 25 to 500 cells per cumm, the predominant cell type being lymphocytes confirmed the diagnosis.

Examination of Child:

A detailed history of present illness pertaining to an insidious onset of fever, vomiting, headache in an older child, change in disposition of the child, convulsions and alteration in consciousness, was recorded in each case.

Due importance was given to obtain the history of contract in each case, as well as to record the immunisation status regarding B.C.G. vaccination. The nutritional status of the child was evaluated by a detailed dietary history. Past history was recorded in each case to elicit a definite history of primary complex, measles, pertussis, ear discharge, head injury, convulsions and worm infestations.
A detailed clinical examination was carried out to assess the stage of the disease by a thorough neurological examination. In general the pattern in the untreated child may be divided into 3 stages (according to WALDOE, NELSON, Text book of Paediatrics).

I. Prodromal stage - In this stage the manifestations are vague. There may be fever, change in disposition, irritability, complaints of headache, anorexia, vomiting and constipation.

II. Transitional stage - convulsions, meningeal signs, exaggeration of deep reflexes, ocular paralysis and vasomotor disturbances are the main manifestations of this stage. In this stage course is progressive and the drowsiness tends to be replaced by stupor.

III. Terminal stage - comatose stage, dilated and unresponsive pupils, wide spread paralysis, irregular pulse and irregular respiration and raised temperature are the important findings of this stage.

Ocular examination:

A detailed ocular examination was carried out in each case of tuberculous meningitis under following heads -

(1) Ocular complaints - regarding pain, redness, watering discharge, unable to identify objects or deviation of eyes were noted.

(2) Ocular aspect - Due importance was given to the pupillary examination. Presence of ptosis, nystagmus or squint were
noted. Involvement of cranial nerves especially of IIIrd, VIth and VIIth were also noted. A detailed ocular examination was carried out with help of Binocular loupe and bright torch light.

(3) Ophthalmoscopy - A detailed fundus examination regarding media, optic disc (size, shape, colour, margins and cup) retinal vessels, macula, choroid and retina, was carried out in each case of tuberculous meningitis by Keeler's, Direct Ophthalmoscope. The dilatation of pupil was carried with 10% phenyl ephrine or atropine 1% and child was under sedation during fundus examination.

First ophthalmoscopic examination was carried out at the time of admission on the basis of provisional diagnosis of tuberculous meningitis based on clinical picture. Lateron when the diagnosis was confirmed repeated fundus examination was carried out in each case, initially biweekly and later on weekly during the hospital stay of the child. The cases having ocular problems were followed up after discharge from hospital for management.

The optic nerve involvement was noted in the form of papillitis, papilloedema or optic atrophy. The criteria for diagnosing papillitis, papilloedema or optic atrophy was based on Duke Elder's description (System of Ophthalmology Vol XII - Neuroophthalmology 1971).
I. Papillitis (Fig. 3) – The diagnosis of papillitis based on following points.

- Disc hyperaemic with blurred margins.
- Exudates and haemorrhages may be present in the tissue of disc but in less quantity.
- Pain or tenderness on movement of eyewall especially upwards and medially.
- Sudden visual loss.
- Defective pupillary reaction to light.

II. Papilloedema (Fig. 4).

- Increased redness of the disc with a slight haziness and blurring of its margins first at upper and lower nasal quadrants and lateron round the disc.
- At fully developed papilloedema the disc assumes the color of the retina and its position is indicated only by the confluence of the larger vessels small linear haemorrhages and exudative patches are present and oedema is more than 2 dioptres.

III–Optic atrophy (Fig. 5)– The diagnosis of optic atrophy was based on the visual acuity of Child, pupillary reactions and colour of disc.

From point of ophthalmoscopic appearances optic atrophy grouped into 2 types in this study.

(a) Primary – The disc is white with sharply defined edges.
- Size diminished and having a saucer shaped excavation.
- Minute vessels of disc disappeared.
- Surrounding retina having usual appearance.
- Retinal vessels appearing normally but arteries are having diminished calibre.

(b) Post Neuritic - Disc dense white or greyish with irregular margins.
- Haze present, minute vessels lost and it is covered by connective tissue.
- Lamina cribrosa is hidden.
- Retinal vessels enclosed by white lines.

Investigations of case - Each case of tuberculours meningitis was investigated for leucocyte count (total and differential) haemoglobin, erythrocyte sedimentation rate and other specific necessary investigations if needed.

Management of ocular problems:

Antitubercular treatment (Isoniazid, Streptomycin, Ethambutol, and Rifampicin) was given in each case along with supportive therapy. Cortisones were added to the antitubercular treatment as an adjuvant. These were administered by different routes viz. Orally, intramuscularly, intravenously or by retrobulbar injections.

The management of ocular problems was carried out as follows -

Ocular problems - To prevent the eye from exposure keratitis and corneal involvement in various ocular pareses, Achromycin
eye suspension was applied locally. In cases of corneal ulcer local application of antibiotic ointment along with atropine eye ointment was given with pad & bandage.

Papilloedema - In the management of lowering intracranial tension following drugs were given according to the merits of case.

1. Mannitol (20%) 1.5 - 2 gm/kg. body weight was administered 6 hourly by intravenous drip.


3. Glycerol 0.5 - 1.5 gm/kg. body weight was given orally in 2-3 divided doses.

Papillitis and postneuritic atrophy -

In these cases along with dexamethasone (Decadron), Vasodilators viz. tolazoline hydrochloride (Priscol) were given by R/B injections. A course of 10 injections one on alternate day was given in the dose of 1 mg dexamethasone and 6.5 mg tolazoline hydrochloride to each eye.

B1, B6 and B12 (Triredisol drops) and xantinolnicotinate (Complamina) 75 mg thrice daily were given minimum for 2 months and more depending on the condition by systemic route.
Fig - 3: PAPILLITIS
Fig - 5: OPTIC ATROPHY

primary

Post-neuritic