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# Sudden Blindness in Children Passing Round Worm per Oral

**Avinash Shankar[1*], Amresh Shankar[2], Anuradha Shankar[3] and Shubham[4]**

[*1]*Institute of Applied Medicine, National Institute of Health and Research, Warisaliganj (Nawada), Bihar, India*

[2]*Aarogyam Punarjeevan, Ram Bhawan, Patna, India*

[3]*Centre for Indigenous Medicine and Research, Regional Institute of Ayurveda Research, Itanagar, Arunachal, India*

[4]*Department of Pediatrics, GMC, Thiruanantpuram, Kerala, India.*

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## ABSTRACT

*Ascaris lumbricoides* infestation is the most prevalent parasitic infection among the children in tropical and developing country but incidence of sudden blindness on passing the worm per oral is undocumented, the lag period depend on the prodromes and varies from 5 days, investigation reveal mere raised eosinophilic count and decreased hemoglobin with normal CT scan and CSF examination.

**Materials:** 10 cases of sudden blindness investigated and treated at various centre without any positive response attended our centre after 30-45 days of incidence, during January 2018 to March 2019 were selected.

**Methods:** Selected patient's parent were interrogated for the course of disease, treatment taken and their response, patients were clinically examined, investigated for basic bio parameters, vision and were treated with the prescribed regime containing pyridoxin, methyl cobalamin, nicotinamide, pantothenic acid and herbal neurovitalizer composite NEUROVIT.

**Results:** All patients had progressive vision gain and attended complete vision on 6 months therapy without any adversity and residual effect or any alteration in hepato-renal profile.

**Conclusion:** Sudden blindness in children after passing round worm or with history of round worm must be suspected for photoreceptor blockade by roundworm toxin and be treated with pyridoxin and herbal neurovitaliser to assure complete recovery.

**Keywords:** *Ascaris lumbricoides*, CT scan, CSF, Photo receptor, Neurovitaliser, Recovery

## INTRODUCTION

Prevalence of intestinal worm infection is 49.35% and *Ascaris lumbricoides* is most common parasitic infection 46.85% soil transmitted Helminth infection form the most important group of intestinal worm affecting 2 billion people world-wide causing considerable morbidity. *Ascaris lumbricoides* remain the most prevalent parasitic infection, i.e., 75% despite of therapeutic response of Albendazole and Mebendazole, but eradication is difficult due to recurrent infection. Considering the changing effect of worm infestation GOI has launched a program to combat the worm infestation, i.e., National deworming day for children of age group 1-19 years biannually. As per WHO >836 million children are at risk of parasitic manifestation worldwide and 214 million children are of age group 1-14 years [1-14]. In addition evidence of disproportionate worm infestation [15] and self-drug use resulting resistance to available deworming agent and presently a combination of parasitocide, i.e., Albendazole and Ivermectine [16] is in quite consideration. As these agents only act on adult worm not on cyst or ova its recurrent dose must be prescribed as on 45$^{th}$ day every ova is developed to active adult round worm.

## MATERIALS AND METHODS

### Materials

10 children attending the centre for critical care with complaints of sudden blindness after passing round worm per oral having treated at various hospitals without any positive response and were suggested brain surgery,

**Corresponding author**: Dr. Avinash Shankar, Chairman, Institute of Applied Medicine, National Institute of Health and Research, Warisaliganj (Nawada), Bihar, 805130, India, E-mail: dravinashshankar@gmail.com

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ophthalmological examination, CT brain shows no evident pathology except blood showing high eosinophilic count.

| Patients | Age/Sex | Clinical presentation | Lag period |
|---|---|---|---|
| A | 10/F | History of passing round worm per oral, lose motion, vomiting fever, loss of vision both side | 3 days |
| B | 9/M | Lose motion, vomiting, pain in abdomen, itching in the body, loss of vision both side passage of round worm per oral | 2 days |
| C | 12/M | Vomiting, pain in abdomen, fever urticarial rash over the extremity, passage of round worm per oral, loss of vision both side | 4 days |
| D | 6/M | Vomiting, lose motion, involuntary body movement, urticarial rash, passing round worm per oral sudden blindness | 2 days |
| E | 13/F | Lose motion, urticarial rash, fever, shivering, nausea, pain in abdomen, passage of round worm per oral, sudden blindness | 3 days |
| F | 12/F | Lose motion of white color, dark urine, intense itching with rash, fever, vomit of round worm, abdominal pain, loss of vision | 5 days |
| G | 8/F | Agonising pain in abdomen, lose motion, vomiting, urticarial rash, passage of round worm per oral, loss of vision | 4 days |
| H | 8/M | Nausea, vomiting, urticarial rash, passage of round worm per oral, loss of vision | 5 days |
| I | 6/F | Vomiting, loss of appetite, urticarial rash, passage of round worm, loss of vision | 4 days |
| J | 14/F | Fever, pain in abdomen, vomiting, headache, urticarial rash, passage of round worm both from mouth and stool | 1 day |

**Method**

All the patients presenting with sudden blindness and associated history of passing round worm per oral and treated at various hospitals without any vision improvement in spite of medication and no pathology were detected on various investigation like CT brain, retinal examination and various hematological examination, were interrogated examined thoroughly, investigated for basic hematological, hepatic and renal profile.

All the selected patients were administered the following irrespective of age and presentation:

I.V Mannitol 10% with glycerine. 10% in therapeutic dose.

Inj Methyl cobalamin, Nicotinamide, Pyridoxin and Pantothenic acid with betamethasone. 1 ml intravenous every 4$^{th}$ day very slow.

Syr Herbal neuro energiser (NEUROVIT) 2.5 ml-5 ml every 8 h.

Susp Albendazol 400 mg plus Ivermectin 3 mg at bed time for 5 days.

Bland and simple high carbohydrate diet.

Herbal neurovitaliser NEUROVIT constitutes:

| Each 5 ml | |
|---|---|
| *Acorus calamus* | 100 mg |
| *Herpestis monnieri* | 100 mg |
| *Convolvulus pluricaulis* | 100 mg |
| *Nardostachys jatamansi* | 100 mg |
| *Cassia angustifolia* | 100 mg |

Patients parent were instructed to practice daily to ascertain visual response by finger counting or light reflex, in addition also suggested to mark any adversity or new emerging manifestation if any and report immediately.

Patients were routinely examined on every week to ascertain response of the therapy and safety profile. At the end of therapy when patient ensured their complete vision patients were examined by ophthalmologist for vision and visual acuity.

## OBSERVATIONS

Selected patients were of age group 6-14 years **(Table 1)** and among them 04 was male and 06 female **(Figure 1)**, though they approached for Medicare within the lag period of 3-5 days at appropriate centre, investigated for CT scan, ophthalmological examination to asses vision and retina status which remain within normal limit in all cases, except raised eosinophilic count **(Table 2)**. Patients were treated with many neurotropics and topical eye drops without any positive response. Majority patients attended our centre after 30-45 days of the onset of blindness and lag period of onset of blindness and passing the round worm per oral was 1-5 days while patients presenting with associated CNS manifestation like involuntary movement and headache has very short lag period, i.e., 1 or 2 days. At our centre hematological examination show raised eosinophil count with other normal other parameters, i.e., hepatic and renal.

**Table 1.** Showing distribution of patients.

| Age group (in years) | Number of patients | | |
|---|---|---|---|
| | Male | Female | Total |
| 6-8 | 02 | 02 | 04 |
| 8-10 | 01 | 01 | 02 |
| 10-12 | - | - | - |
| 12-14 | 01 | 03 | 04 |

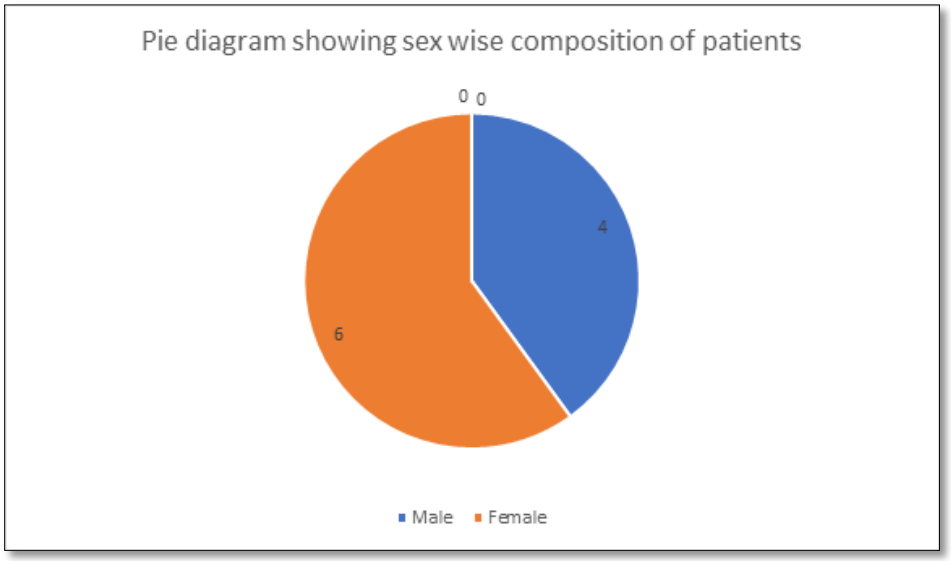


**Figure 1.** Pie diagram showing sex composition of the patients.

**Table 2.** Presentation of the patients.

| |
|---|
| Sudden blindness |
| Passing worm per oral |
| Nausea and vomiting |
| Fever |
| Lag period of onset of blindness and passing the worm per oral: 24-72 h |
| Blurring of vision |
| Sign of avitaminosis /xerosis /bitots spot |

## RESULTS

All patients started visual improvement by 8th day of therapy and complete visual recovery by 6th month of therapy without any visual debility; optometry confirmed the vision in all patients as 6/6 in both eyes **(Tables 3 and 4 and Figure 2)**. No adversity or sequel is noted in any case or any evident of post therapy withdrawal affect, i.e., decline in vision or visual acuity or any CNS manifestation.

**Table 3.** Showing bio parameter status at various states.

| **Basic bio parameters** | **Number of Patients** | | |
|---|---|---|---|
| | **(A)** | **(B)** | **(C)** |
| **Hematological** | | | |
| **Absolute eosinophil count** | | | |
| <200/cc | - | - | 8 |
| 200-300/cc | 3 | 4 | 2 |
| 300-400/cc | 6 | 6 | 0 |
| 400-500/cc | 1 | 0 | 0 |
| **TLC** | | | |
| <6000/cc | 1 | 0 | 0 |
| 6000-7000/cc | 8 | 10 | 10 |
| >7000/cc | 1 | 0 | 0 |
| **Hemoglobin parent** | | | |
| <10 g% | 5 | 3 | 0 |
| >10 g% | 5 | 7 | 10 |
| **Diabetic profile** | | | |
| **Blood sugar** | | | |
| **Fasting:** | | | |
| <100 mg% | 9 | 10 | 10 |
| >100 mg% | 1 | 0 | 0 |
| **Post prandial:** | | | |
| <150 mg% | 10 | 10 | 10 |
| >150 mg% | 0 | 0 | 0 |

| **Hepatic profile** | | | |
|---|---|---|---|
| **SGOT** | | | |
| <30 IU | 7 | 8 | 10 |
| >30 IU | 3 | 2 | 0 |
| **SGPT** | | | |
| <30 IU | 7 | 8 | 10 |
| >30 IU | 3 | 2 | 0 |
| **Alkaline phosphatase** | | | |
| <140 mg% | 10 | 10 | 10 |
| >140 mg% | 0 | 0 | 0 |
| **Renal profile** | | | |
| **Blood urea** | | | |
| <26 mg% | 10 | 10 | 10 |
| >26 mg% | 0 | 0 | 0 |
| **Serum creatin** | | | |
| <1.5 mg% | 10 | 10 | 10 |
| >1.5 mg% | 0 | 0 | 0 |
| **CT scan** | | | |
| Altered | None | None | None |
| Unaltered | 10 | 10 | 10 |
| **Vision** | | | |
| Status of eye | Normal | Normal | Normal |
| **PL** | | | |
| Absent | 10 | 10 | 0 |
| Present | 0 | 0 | 10 |
| **PR** | | | |
| Absent | 2 | 0 | 0 |
| Present | 8 | 10 | 10 |
| **Vision** | Absent | Absent | Normal |

*A – At first centre of treatment; B – At our centre on admission; C – On completion of treatment*

**Table 4.** Outcome of the study.

| Particulars | Number of patients |
|---|---|
| Perception of light | 10 |
| Finger counting | 10 |
| Blurred vision | None |
| Clear distant vision | 10 |
| Clear distant vision | 10 |
| Completely normal vision | 10 |
| Safety profile | |
| Hematological | Improved in all |
| Hepatic profile | Normal in all |
| Renal profile | Normal in all |

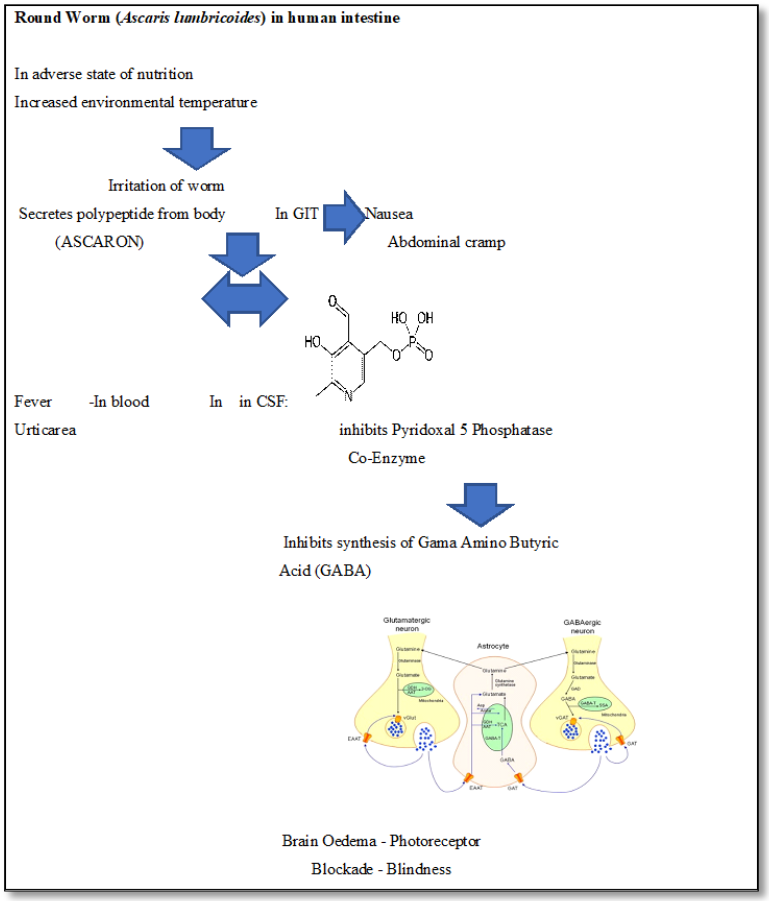


**Figure 2.** Round worm kinetics in intestine.

## DISCUSSION

Round worm infestation is very common but manifestation like blindness after passing the worm per oral is very uncommon or remain unmarked, in addition variable lag period of onset of blindness and worm passage, i.e., 1-5 days suggest its dependence on prodromes, those who had CNS prodromes like headache and involuntary movement had earlier onset [17-22]. Patients presentation on passing worm per oral suggest worm irritation leading to release of a

polypeptide ASCARON which stimulate the intestinal mucosal nerve endings resulting in nausea, vomiting and lose motion, absorption of toxin in blood causes anaphylactic reaction resulting in fever and urticarial rash while access to CSF results in neurosuppression due to inhibition of neurotransmitter GABA as a result of inhibition of coenzyme pyridoxal phosphatase enzyme by the toxin [23,24]. Sudden blindness is due to effect of neuroconduction suppression results in blockade of neurotransmission from photo receptor of retinal fovea **(Figures 3 and 4)** [25,26]. No change in bio parameters are observed in any case and eosinophil count came to normal.

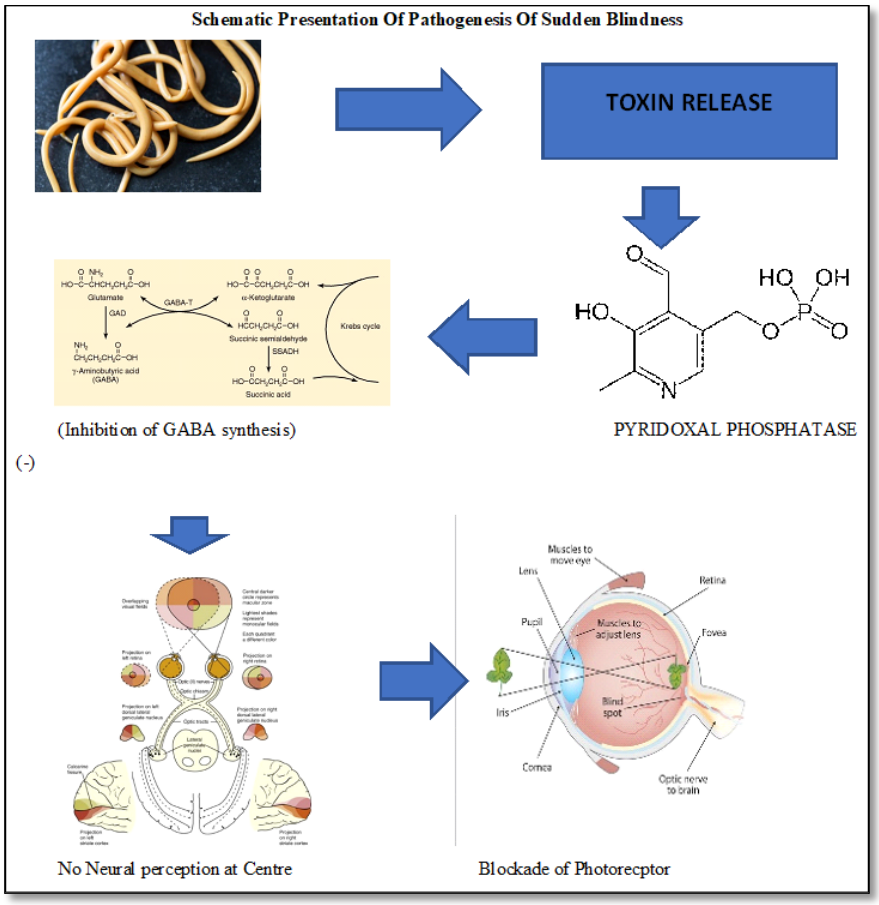


**Figure 3.** Schematic presentation of pathogenesis of sudden blindness.

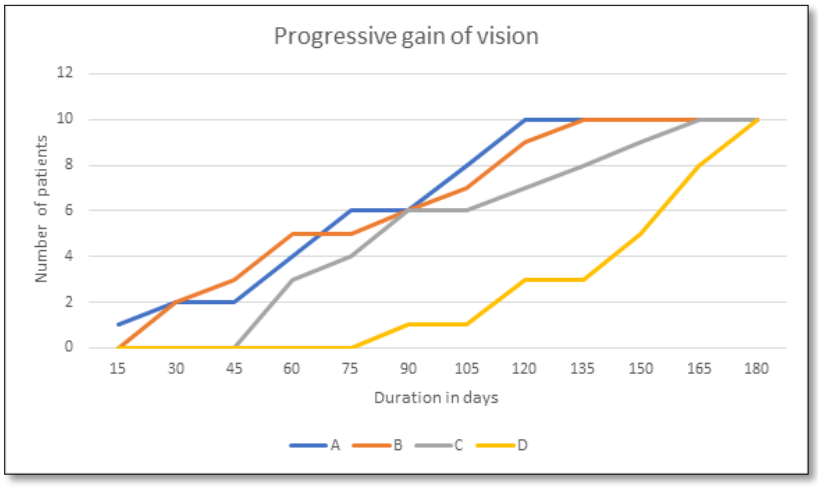


**Figure 4.** Showing pattern of vision improvement.

*A: Perception of light; B: Finger counting; C: Blurred vision; D: Clear vision*

All patients recovered of blindness having progressive vision gain from perception of light to normal vision in 6 months duration with the treatment is attributed to:

- Intravenous mannitol 10% with glycerine 10% relieved neural edema.
- Supplementation of pyridoxin as injection of methyl cobalamin, pyridoxin, nicotinamide and pantothenic acid competitively inhibit polypeptide and activate pyridoxal phosphatase and ensure increased neurotransmitter GABA, methyl cobalamin and pantothenic acid promote neuro conduction.
- Herbal composite NEUROVIT constituents ensure neurovitalization and photoreceptor activation [27].
- Administration of albendazole plus ivermectin ensures worm eradication.
- Nutritious diet support recovery.

## CONCLUSION

Sudden blindness after passing round worm or without patient must be duly taken care suspecting Ascaris toxin as a factor and duly treatment will ensure cure and safety from undue expenses especially in tropical countries where round worm infestation is very common. Herbal composite and pyridoxine supplementation proves boon for cure.

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