Original Research Article

Adverse effect profile of antileshmanial drugs used in the management of Kala-Azar in paediatrics department in a tertiary care teaching hospital in Bihar

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Abstract

Problem statement: Viacreal leishmaniasis is one of the major tropical diseases which has been prevalent in India since time immemorial. It's presence in the Gangetic basin is substantiated by the reference of "KALA-AZAR" in ancient scriptures, to hyperpigmentation of skin. It is the most server from of infection among the spectrum of the disease caused by the protozoa "Leishmania donovani". **Methods**: Patients selection and recruitment were done at the department of Paediatrics while the preparatory work, data analysis and archiving was done in the department of pharmacology, M.G.M. Medical College and L.S.K. Hospital, Kishanganj, Bihar. The entire study from patient recruitment data collection, data analysis to reporting took about one year starting from March 2015 to Feb 2016. After obtaining written informed consent, 60 patients between the age 2- 14 years were randomly selected by computer generated random number and were allotted into two groups ; Group A, Patients who had received 30 days course of Amphotericin B, and Patients who had received 30 days course of Miltefosine. **Results:** In the present study, it was observed that in both the groups, there were no demographic differences but size of spleen, size of liver were decreases significantly on both group but there was no significant differences between two groups. Hemoglobin concentration were raised significantly in both the group but no significant difference was observed between two groups. Blood Urea and Serum creatinine as an indicator of kidney function were measured, it was observe that Blood Urea and Serum creatinine was significantly raised in both the group but there were no significant difference between the two groups. This result indicates both the group Amphotherecin B and Miltefosine are nephrotoxic. **Conclusion:** From this study it appears, there two drugs Amphotherecin B and Miltefosine are very good drugs for leshminiasis, but one point is kept to in mind both of them are nephrotoxic so continuous monitoring of renal function is to be done regularly. In the course of therapy, if anything goes wrong then drug has to be omitted for short time. If the person are already having kidney renal impairment then these two drugs should be avoided and can be treated by alternative Anti lesminial drug.

KeyWords: Leishmaniasis, Amphotherecin B, Miltefosine, nephrotoxic.

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INTRODUCTION

Kala azar is caused by bites from female phlebotomine sandflies – the vector (or transmitter) of the leishmania parasite. The sand flies feed on animals and humans for blood, which they need for developing their eggs. If blood containing leishmania parasites is drawn from an animal or human, the next person to receive a bite will then become infected and develop leishmaniasis. Months after this initial infection the disease can progress into a more severe form, called visceral leishmaniasis or, kala azar.[1]

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Word kala-azar consists of "Kala" (means "Black") and "azar" (means "Fever)"

- Fever associated with dark complexion
- "Black Sickness" would have been appropriate
- "Kala" or "Kal" in Hindi also means "fatal" just as "kala-swarp" means "deadly snake"
- Kala-azar means "Fatal Illness"
- Ross pointed out that black death signifies plague, a fatal illness.
- It indicates terrifying effect of the disease on the imagination of the people rather than the actual reality of disorder
- This explanation applies here also – some cases of kala-azar do not show great pigmentation of the skin

The safety of drugs used in patients of an adult age group cannot be extrapolated to a pediatric age group. The pharmacokinetics and pharmacodynamics of many commonly used drugs vary significantly between these two age groups of patients.[2] Further, adverse drug reactions (ADRs) in children can have a relatively more severe effect when compared to adults. Thus, the ADRs can lead to significant morbidity among children. It has been observed that ADRs in children not only result in hospital admissions or prolonged hospitalization but also may lead to permanent disability or even death[3]

Médecins Sans Frontières (MSF) is on the frontline of combating kala azar in Bihar.[4]

Bihar is the epicentre of kala azar in India, where 33 out of 38 districts are affected. The population at risk is nearly 35 million in approximately 11,500 villages spread over 429 provincial blocks. In September 2014, the first-line treatment for kala azar in India was changed to a single dose of Liposomal Amphotericin B (LAmB). The policy was changed following crucial safety evidence from an MSF-DNDi (Drugs for Neglected Diseases initiative) pilot study. The change to single dose LAmB sets a milestone towards achieving the 2015 elimination goal. Although there's a decrease in the number of kala azar cases, challenges persist in the form of post kala azar dermal leishmaniasis (PKDL) and co-infection of kala azar with HIV. A study published by MSF in June 2014 highlights the magnitude of the problem, both at the individual and public health levels. It concludes that an inter-programmatic management is required, if kala azar elimination is to be achieved. Besides, what is crucially needed is further evidence on best treatment regimen for this group of co-infected patients. Some of the agents with efficiency against visceral leishmaniasis, such as pentavalent antimonial drugs, amphotericin B, pentamidine, miltefosine, paromomycin and simataquine, might be associated with high risk of renal toxicity.

Amphotericin B and its new formulations

Conventional amphotericin B deoxycholate has progressively substituted for pentavalent antimonial compounds in several countries due to increasing treatment failure rates[6.] This drug possesses high anti-leishmanial efficacy but it is associated with a high risk of renal toxicity in addition to other side effects (rigour, fever, malaise, anorexia, trombophlebitis and bone marrow suppression)[5]

Miltefosine

This is the only oral agent currently in use for treatment of visceral leishmaniasis. This agent was tested in six-dose finding studies and one comparative study performed between 1998 and 2000, involving 665 patients. Moderate to severe nephrotoxicity was reported in 2 and 1% of patients, respectively, and this was dose related[7.] Renal involvement in human visceral leishmaniasis might be characterized by complex and varying clinical features. Both glomerular and tubular function can be altered and patients can develop proteinuria, hematuria, abnormalities in urinary concentration and acidification, acute and chronic renal insufficiency. They might be caused both by the disease itself as well as by the drugs administered to treat the infection

MATERIAL AND METHODS

Type of Study: Adverse effect profile of antileshmanial drug in the management of kala azar in paediatrics department in a tertiary care teaching hospital, Visceral leishmaniasis can be completely treated and cured however it requires prompt and complete treatment. Currently in India there are six drugs available for treating VL patients. These are Sodium Stibogluconate (SSG), Pentamidine Isethionate, Amphotericin B, Liposomal Amphotericin B, Paromomycin, and Miltefosine. The treatment with liposomal Amphotericin B for relapse case of Kala-azar with Miltefosine is quite new. A Prospective observational cross sectional study of Amphotericin B and Miltefosine therapy in children with visceral leishmaniasis.

Study Setting: Patients selection and recruitment were done at the department of Paediatrics while the preparatory work, data analysis and archiving was done in the department of pharmacology, M.G.M. Medical College and L.S.K. Hospital, Kishanganj, Bihar.

Study Period: The entire study from patient recruitment data collection, data analysis to reporting took about one year starting from March 2015 to Feb 2016.

Study Design: The present study is a prospective randomized, open label, parallel group comparative study between Amphotericin B and Miltefosine in the management of Kala azar.

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Study population and Patients Selection: All consecutive children 2 year to 14 years. Presented with fever, Splenomegaly and positive LD body in splenic aspirate examination, were admitted in Pediatric ward of M.G.M. Medical College and L.S.K. Hospital, Kishanganj, Bihar, were taken for study. Total 60 Patients were randomized into 2 groups.

- **Group A:** Patients received 28 days course of (10mg/kg/day) IV Amphotericin B on alternate day
- **Group B:** Patients received 28 days course of (2.5mg/kg/day) orally Miltefosine daily.
- All patients were monitored for adverse events, haematological variables, serum chemistry and splenic size below left costal margin.

Study Design: All cases of Kala azar were actively screened by paediatrician for presence of suspected areas ADRs during treatment and subsequently causality assessment was done using WHO UMC scale. Only those cases where the causality was certain, probable and likely was recorded. Detailed clinical history, drug history and relevant information like onset of reaction, its duration and temporal association drug intake if any, enlisted of all drugs taken preceding the onset of reaction, past history of drug rashes, all the above information will be recorded in a predesigned ADR reporting form by Govt. Of India and case report form. The data was compiled on a excel sheet and subjected to descriptive statistical analysis. Detailed recoprd of demographic and clinical features would be noted in 'case Record Form' after written informed consent from the parents or guardian. Family history will be traced in detail.

Clinical assessment during treatment and at follow up: Patients were followed for 6 months after course of treatment. The parasitological analysis of splenic aspirate were performed at completion of therapy. 1 month and 6 months. The density of parasites was graded from 0 (no parasite / 10000 high power field) to 6 (> 100 parasites/ field). The cure was defined as an absence of parasites at the end of therapy and no relapse during six months of follow up. Relapse was defined by appearance of symptoms and signs suggestive of leishmaniasis with demonstrable LD bodies in splenic aspirates after initial cure. Amphotericin B was given at a dose 10 mg/kg/day. i.v for 28 days,alternate days, after sensitivity test to group A patients and Miltefosine was administered orally for 28 days at a dose of 2.5 mg/kg/day orally o.d group B patients. During therapy patients were monitored daily for vital signs, splenic, size and adverse events, Hematological (CBC), biochemical (AST, ALT, BUN, Creatinine) and splenic size below left costal margin were monitored weekly during therapy, at completion, after 1 month and 6 months.

RESULTS

After obtaining written informed consent, 60 patients between the age 2- 14 years were randomly selected by computer generated random number and were allotted into two groups ; Group A, Patients who had received 30 days course of Amphotericin B, and Patients who had received 28 days course of Miltefosine. The two groups were similar with regards to demographic data, clinical features, splenic size baseline laboratory investigations and baseline parameters, which will be details later in this section, statistically,

Table 1: Showing distribution of Age among groups A and B

Age group in year	Group A (n30)		Group B (n30)		Total (n60)	
2-4	2	6.66%	1	3.33%	3	5.00%
5-7	8	26.66%	12	40.00%	20	33.33%
8-10	10	33.33%	8	26.66%	18	30.00%
11-13	8	26.66%	6	20.00%	14	23.33%
14	2	6.66%	3	10.00%	5	8.33%

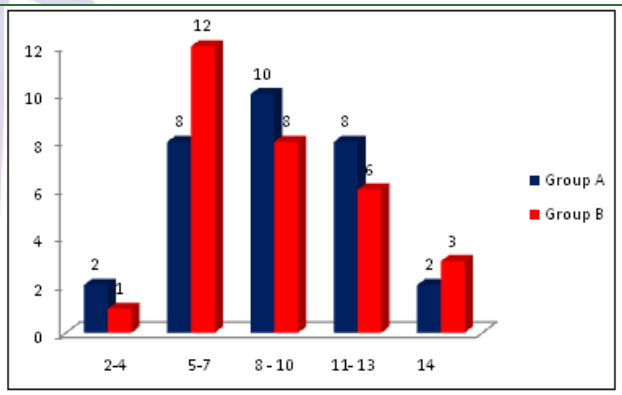

Figure 1: Age Group of Group A and Group B

The mean age group of the study sample was (Group A- mean 8.70 ± 3.15) and (Group B- mean 8.46 ± 0.56) participants belong to 2- 14 years of age. Age wise distribution of the two group is shown in Table 1 and Figure 1 and2.

Table 2: Showing sex distribution of patients Group A and Group B

Sex	Group A (n30)		Group B (n30)		Total (n60)
Male	22	73.33%	18	60.00%	100 %
Female	08	26.66%	12	40.00%	100 %

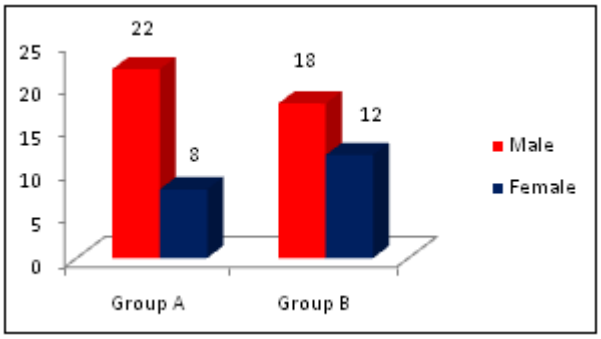

Figure 3: Sex distribution

Out of the select participant, in Group A 22 were male and 8 were female patients and Group B 18 were male and 12 were female patients. Gender wise distribution of the two groups in shown Table: 2 and figure: 3

Table 3: Showing weight in group A (10 mg/1kg weight daily) before. During treatment and at follow up.

Day of observation	Weight in kg
During treatment	Mean ± SD
Day1	24.36 ± 7.45
Day8	25.2 ± 7.32
Day15	26.3 ± 7.48
During follow up	
First Month	26.9 ± 7.20
Second Month	27.1 ± 7.15
Third Month	28.1 ± 7.21
Forth Month	28.5 ± 7.11
Six Month	28.6 ± 7.10

Mean weight gain at the end of treatment was 1.94kg Table 3 shows weight in kg of Group A patient before. During treatment and follow up on day 1st, 8th, 15th at one month at 2nd month at 3rd month and 6th month of therapy as 24.36 ±7.45, 25.2 ± 7.32, 26.3 ± 7.48; 26.0 ± 7.20; 27.1 ± 7.15; 28.1 ± 7.21; 28.5 ± 7.11; 28.6 ± 7.10 respectively.

Table 4: Showing weight in group B Patients (20mg/kg/day/ weight on day daily) before. During treatment and at follow up

Day of observation	Weight in kg
During treatment	Mean ± SD
Day1	22.83 ± 6.73
Day8	23.11 ± 6.62
Day15	23.20 ± 6.65
Day 22	23.31 ± 6.56
Day 30	25 ± 6.72
During follow up	
Second Month	26.00 ± 7.06
Third Month	26.70 ± 7.04
Forth Month	26.82 ± 7.03
Six Month	27.02 ± 7.02

Mean weight gain at the end of treatment was 1.94kg Table-4 shows weight of patient Group B before. During treatment and at follow up on day 1st, 8th, 15th, 22nd 30th at follow up 2nd month at 3rd month 4th month and 6th month as 22.83 ± 6.73; 23.11 ± 6.62; 23.2 ± 6.65; 23.31 ± 6.56; 25 ± 6.62; 26.00 ± 7.06; 26.70 ± 7.04; 26.82 ± 7.03; 27.02 ± 7.02 respectively.

Table 5: Showing splenic size in cm. in group A patients before. During treatment and at follow up

Day of observation During treatment	Weight in kg Mean ± SD	p Value
Day1	5.066 ± 2.24	
Day8	2.4 ± 1.63	
Day15	1.00 ± 0.93	
Day 22	0.93 ± 0.8	
Day 30	0.73 ± 0.21	
During follow up		<0.05
First Month	0.4 ± 0.68	
Second Month	0.2 ± 0.22	
Third Month	Not Palpable	
Forth Month	Not Palpable	
Six Month	Not Palpable	

At the end of treatment mean size of spleen was 1 cm and it was not palpable at the end of third Month Table-5 shows mean size of spleen in cm before, during treatment and at follow up on day 1st, 8th, 15th, at one month at 2nd month at 3rd month and 6thmonth as 5.066 ± 2.24; 2.4 ± 1.63; 1.00 ± 0.93; 0.8 ± 0.5; 0.4 ± 0.68; 0.2 ± 0.22 by the end of 3rd month of therapy. Spleen was not palpable and it remained so till the end of six months. There was significant ($p<0.05$) reduction in mean size of spleen during the 8th day of treatment.

Table 6: Showing splenic size in group B Patients before. During treatment and at follow up

Day of observation During treatment	Weight in kg Mean ± SD	p Value
Day1	5.068 ± 2.01	
Day8	2.86 ± 2.04	
Day15	2.73 ± 1.98	
Day 22	1.2 ± 0.86	
Day 30	0.76 ± 0.76	
During follow up		<0.05
Second Month	0.46 ± 0.44	
Third Month	0.22 ± 0.18	
Forth Month	Not Palpable	
Six Month	Not Palpable	

At the end of treatment mean size of spleen was 0.76 but it was not palpable at the end of fourth Month Table-6 represents mean size of spleen in Group B patient before. During treatment and at follow up on day 1st, 8th, 15th, 22nd, 30th at follow up 2nd month at 3rd month 4th month and 6th month as 5.06 ± 2.01; 2.86 ± 2.04; 2.73 ± 1.98; 1.2 ± 0.86; 0.76 ± 0.76; 0.46 ± 0.44; 0.22 ± 0.18. By end of fourth month of therapy spleen was not palpable. There was significant ($p<0.05$) reduction in spleen size during 2ndweek of therapy. None of the patient reported increase in spleen size during follow up.

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Table 7: Showing (mean) temperature of patients (º f) in group a during treatment and at follow up

Day of observation During treatment	Weight in kg Mean ± SD	p Value
Day1	102 ± 2.8	
Day8	97.6 ± 1.0	
Day15	96.2 ± 0.6	
During follow up		
First Month	96.4 ± 0.48	<0.05
Second Month	97.0 ± 0.22	
Third Month	96.6 ± 0.68	
Forth Month	97.1 ± 0.32	
Six Month	96.8 ± 0.4	

Mean Body Temperature of patients touched normally by 5th day. Table-7 Represents mean body temperature of patient of Group A before, during treatment and at follow up on day 1st, 8th, 15th, at one month at 2nd month at 3rd month and 6th month as 102 ± 2.8; 97.6 ± 1.0; 96.2 ± 0.6; 96.4 ± 0.48; 97.0 ± 0.22; 96.6 ± 0.68; 97.1 ± 0.32; 96.8 ± 0.4 respectively. Mean body temperature touched the normal level by the beginning of 2nd week i.e. 8thday of therapy and was maintained during follow up.

Table 8: Showing Body Temperature of patients (º f) in group B during treatment and at follow up

Day of observation During treatment	Weight in kg Mean ± SD	p Value
Day1	102.8 ± 2.6	
Day8	97.8 ± 1.1	
Day15	97.0 ± 0.62	
Day 22	96.2 ± 0.32	
Day 30	96.6 ± 0.62	<0.05
During follow up		
Second Month	97.01 ± 0.32	
Third Month	96.8 ± 0.33	
Forth Month	96.4 ± 0.42	
Six Month	97.2 ± 0.26	

Mean Body Temperature of patients touched normal level by 8th day therapy. Table-8shows mean body temperature of Group B patient before, during treatment and at follow up on day 1st, 8th, 15th, 22nd, 30th at follow up 2nd month at 3rd month, 4th month and 6th month as 102.8 ± 2.6; 97.8 ± 1.1; 97.0 ± 0.62; 96.2 ± 0.32; 96.6 ± 0.62; 97.01 ± 0.32; 96.8 ± 0.33; 96.4 ± 0.42; 97.2 ± 0.26 respectively.

Table 9: Showing size of liver in cm in group A patients before. During treatment and at follow up

Day of observation During treatment	Weight in kg Mean ± SD	p Value
Day1	2.45 ± 1.15	
Day8	1.28 ± 1.04	
Day15	0.6 ± 0.57	
During follow up		
First Month	0.5 ± 0.3	<0.05
Second Month	0.4 ± 0.1	
Third Month	0.1 ± 0.02	
Forth Month	Not enlarged	
Six Month	Not enlarged	

The Mean liver size was 0.6 at the end of therapy and it was not enraged by the end of fourth Month Table-9shows size of liver in cm in Group A patient before, during treatment and at follow up on day 1st, 8th, 15th, at one month at 2nd month at 3rd month and 6th month at 2.45 ± 1.15; 1.28 ± 1.04; 0.6 ± 0.57; 0.5 ± 0.3; 0.4 ± 0.2 and 0.1 ± 0.02 respectively. Liver was not enlarged by the end of 2nd month and it remained so during whole of follow up till 6th month of therapy. The mean size of liver was significant (p<0.05).

Table 10: Showing size of liver in cm in group B patients before. During treatment and at follow up

Day of observation During treatment	Weight in kg Mean ± SD	p Value
Day1	2.03 ± 0.93	
Day8	1.8 ± 0.75	
Day15	1.1 ± 0.88	
Day22	0.8 ± 0.68	
Day30	0.5 ± 0.42	<0.05
During follow up		
Second Month	0.4 ± 0.1	
Third Month	0.2 ± 0.12	
Forth Month	Not enlarged	
Six Month	Not enlarged	

The Mean liver size was 0.5 cm at the end of therapy and it was not enraged by the end of fourth Month Table-10Showing size of liver in Group B patient before, during therapy and at follow up on day 1st, 8th, 15th, 22nd, 30th at follow up 2nd month, at 3rd month, 4th month and 6th month as 2.03 ± 0.93; 1.8 ± 0.75; 1.1 ± 0.88; 0.8 ± 0.68; 0.5 ± 0.42; 0.4 ± 0.1 and 0.2 ± 0.12 respectively.

Table 11: Showing size Haemoglobin concentration in gm/ litre in group A patients before, during treatment and at follow up

Day of observation During treatment	Weight in kg Mean ± SD	p Value
Day1	73.4 ± 15.8	
Day8	78.8 ± 15.3	
Day15	103.4 ± 7.95	
During follow up		
First Month	110 ± 10.6	<0.05
Second Month	112 ± 6.8	
Third Month	144 ± 5.6	
Forth Month	114.2 ± 5.5	
Six Month	116 ± 4.2	

There was significant (p< 0.05) rise in total Hb concentration by 15th day of treatment. Table-11 shows mean hemoglobin concentration of Group A patient before, during treatment and at follow up on day 1st, 8th, 15th, at one month at 2nd month at 3rd month and 6th month as 73.4 ± 15.8; 78.8 ± 15.3; 103.4 ± 7.95; 110 ± 10.6; 112 ± 6.8; 114 ± 5.6; 114.2 ± 5.5; 116 ± 4.2 respectively.

Table 12: Showing size Haemoglobin concentration in gm/ litre in group B patients before, during treatment and at follow up

Day of observation During treatment	Weight in kg Mean ± SD	p Value
Day1	4.03 ± 0.7	
Day8	4.42 ± 0.75	
Day15	5.12 ± 0.53	
Day22	5.8 ± 0.52	
Day30	5.84 ± 0.55	<0.05
During follow up		
Second Month	5.9 ± 0.55	
Third Month	6.02 ± 0.42	
Forth Month	6.06 ± 0.33	
Six Month	6.02 ± 0.12	

There was significant ($p< 0.05$) rise in total Hb concentration by 15th day of treatment. Table-12 shows mean hemoglobin concentration of Group B patient before, during treatment and at follow up on day 1st, 8th, 15th, 22nd, 30th at follow up 2nd month at 3rd month 4th month and 6th month as 70.96 ± 13.4; 72.2 ± 13.0; 85.5 ± 11.6; 88.1 ± 10.5; 96.8 ± 8.4; 108 ± 11.3; 110.2 ± 9.6; 114 ± 6.6; 112 ± 4.6 respectively.

Table 13: Showing Grading of L.D. bodies (No/1.1000 fields) found in splenic bone marrow aspirate in group A Patient during treatment.

Day of Observation	Blood urea nitrogen level in mmol/L Mean ± SD
Day1	3 ± 1
Day8	1.3 ± 0.7
Day15	0 ± 0

There was significant ($p< 0.05$) fall in grading L.D. bodies in splenic aspirate by the 8th day of therapy Table-13 Shows L.D. body grading of patient of group A at 1st, 8thand 15th, day of therapy as 3 ± 1; 1.3 ± 0.7; 0 ± 0 respectively.

Table 14: Showing Grading of L.D. bodies (No/1.1000 fields) found in splenic bone marrow aspirate in group A Patient during treatment

Day of Observation	Blood urea nitrogen level in mmol/L Mean ± SD
Day1	3 ± 1
Day8	2 ± 1
Day15	1.3 ± 0.7
Day22	1 ± 0.2
Day30	0 ± 0

There was significant ($p< 0.05$) reduction in L.D. bodies in grading by the 15th day treatment and all patient were free from L.D. bodies by 30th day of treatment Table-14 Shows LD body grading in Group B at 1st, 8th, 15th, 22nd, 30th day of therapy as 3 ± 1; 2 ± 1; 1.3 ± 0.7; 1 ± 0.2 and 0 ± 0 Respectively.

Table 15: Showing comparison of cure among patient of group A and group B

	Group A	Group B
Clinical	100%	100%
Parasitological	100%	100%

Table-15 Shows clinical cure and parasitological cure of patient of both groups at the end of treatment which was 100% in both groups. Anorexia nausea and vomiting was observed in 9 patients (30%) of group A and 6(20%) patient in Group B. the difference between two was not significant ($P>0.05$). Nausea and vomiting responded to proper hydration, adequate salt intake, fruit juice, Potassium supplement and adequate nutrition. The efficacy of treatment is shown in table: 3 to 27 at the completion of Amphotercin B and Miltefosine therapy and all patients were parasitologically negative.

CONCLUSION

In the present study, 60 patient of diagnosed cases of Kala-azar were studied in the Department of Pediatrics, during the period march 2014 to feb 2016. All the patients were thoroughly evaluated by clinical parameters and investigations including CBC, Liver function test, Renal function test, ECG.

Groups A Patient recived slow infusion intravenously Amphotericin B in the dose schedule of 10 mg per Kg body weight dissolved in 250 or 500 ml of 5% dextrose, depending on body weight, on alternate day for 28 days.

Group B Patients recived therapy Miltefosine 2.5 mg/kg/day. Daily for 28 days. During the therapy, clinical and parasitological response and adverse effect of drug in both groups were closely monitored. In both the groups clinical picture improved by reduction in the size of spleen, size of liver and increased Hb concentration. But in the both groups, renal impairment was observed. Blood Urea and Serum creatinin level were increased significantly is both the group and threre were no significant difference between the two groups. From this study it appears, there two drugs Amohericn B and Miltefosine are very good drugs for leshminiasis, but one point is kept to in rnind both of them are nephrotoxic so continuous monitering of renal function is to be done regularly. In the course of therephy, if anything goes wrong then drug has to be omitted for short time. If the person are allready having kidney renal impairment then these two drugs should be avoided and can be treated by alternative Anti lesminial drug.

REFERENCES

1. Clem A. A current perspective on leishmaniasis. J Glob Infect Dis 2010; 124–126.
2. Murray. Failure of pentavalent antimony in visceral leishmaniasis in India: report from the International Journal of Pharmaceutical Science and Health Care Issue 5, Vol. 3 (May-June. 2015)
3. R S. Publication, rspublicationhouse@gmail.com Page 55 center of the Indian epidemic. Clin Infect Dis 2000; 31: 1104–1107.

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4. Barbieri, C. L. Immunology of canine leishmaniasis. Parasite Immunol 2006; 28:329-37.
5. Solano-Gallego, L., A. Koutinas, G. Miro, L. Cardoso, M. G. Pennisi, L. Ferrer, P.
6. Chappuis, F., S. Sundar, A. Hailu, H. Ghalib, S. Rijal, R. W. Peeling, J. Alvar, and M.
7. Singh SP, Picado A, Boelaert M, Gidwani K, Andersen EW, Ostyn B, et al. The epidemiology of Leishmania donovani infection in high transmission foci in India. Trop Med Int Health 2010; 15:12-20.

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