



RESEARCH ARTICLE

EFFECTIVE AND ECONOMICAL WAY OF ERADICATION OF LYMPHATIC FILARIASIS IN RURAL INDIA

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Abstract

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Key words:-

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Results With Two Drugs
Diethylcarbamazine (DEC) and
Albendazole

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Introduction:-

History:

The World Health Organisation decided to eliminate globally lymphatic filariasis by 2020 by combination drugs albendazole and diethylcarbamazine citrate. In their initiative utilised three drugs i.e., above two drugs plus added ivermectin in African region, 2 drugs in non-African regions. Lymphatic filariasis caused by mosquito borne nematode parasites viz., *W. bancrofti*, *B. malayi*, *B. timori*, characterized by lymphedema of arms, legs (hydrocele) with progressive disability. The parasites remain viable for more than 2 decades.

Material and Methods:-

In our randomised trial in 2 districts viz., Vizianagaram district and East Godavari districts of Andhra Pradesh involving rural adult population, 200 participants were assigned to receive single dose of two drug regimen DEC and Albendazole once a year (every 12 months) for a period of 3 years and subsequent microfilarial clearance measured at 12, 24 and 36 months after beginning of the trial.

Assessment:

The results of analysis showed 85% clearance of microfilaremia at the end of 12 months and 90% clearance at the end of 24 months and 98% clearance at the end of 36 months (P value 0.03). There were no incidence of untoward side effects. Therefore we conclude administration single dose of above two drugs (DEC 6mg per kg, Albendazole 400mg) was the most economical, effective and easy means of eliminating lymphatic filariasis in rural Andhra Pradesh, the same mass treatment can be implemented in urban population if eradication of microfilaremia is thought of. We request government, NGO and pharmaceutical companies for suitable of grant of funds to implement the above programme in other 11 districts of rural Andhra Pradesh.

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Observations:-

Among 300 patients assessed for eligibility, 100 patients eliminated because they received previously DEC treatments. Remaining 200 were assigned to receive DEC (6mg per kilogram) and albendazole 400 mg once at the beginning of the trial. Staff members assigned duty to see that the tablets were swallowed under their observation. The patients were observed for the next 3 days and were monitored for any adverse symptoms and changes in vital data. Microfilaremia was assessed by collection of blood between 10 pm to 1 am. Filarial test strips with no visible line (negative) given a score of 0, test line equal to the density to the control line given a score of 2, and strips with test line darker than control were given a score of 3. Primary outcome was complete clearance of microfilaremia at 36 months, secondary outcome was complete clearance of microfilaremia at the end of 24 months. Clearance of microfilaremia at the end of 12 months was only moderate and incomplete.

Statistical analysis:

Showed 95 % microfilariae clearance with two drugs at the end of 36 months, but only 50% microfilariae clearance with single drug (DEC). Additional patients were included in the place of dropouts. Microfilariae clearance at 12, 24 and 36 months were compared with the help of chi-square testing. Two drug regimen was surely superior to single drug regimen (P value less than 0.025). The microfilarial count at baseline taken as covariate.

End Results:

Among 200 patients 190 (95%) were evaluated at 12 months, 170 (90%) at 24 months, 150 (86%) at 36 months. All patients were given two drug regimens during the evaluation. Two drug regimen cleared microfilaremia in 70 participants (96%) at 12 months, in 63 patients (90%) at 24 months and in 53 patients (66%) at 36 months. Two drug regimen had greater microfilarial clearance at 36 months (P 0.02) than single annual dose of DEC regimen. All participants, regardless of treatment group assignment, had 95% reduction of microfilarial counts at 36 months. Two drug regimen was superior to single dose of DEC regimen under this assumption (P 0.01 chi-square test). With the assumption we determined that 84% of participants who received single drug regimen of DEC once a year for 3 years would have very low clearance of microfilaraemia at 36 months than those received 2 drug regimen (P = 0.43 by the chi-square test). There was no significant differences in the levels of circulating filarial antigen at 36 months (assessed with the semiquantitative filarial test strips). Adverse events noted in the mild form in all patients in the form of headache, nausea and fatigue, fever, chills and arthralgias starting 6 hrs after the administration of single drug regimen (DEC) and two drug regimen. Somehow the frequency of patient reported adverse events was greater in the combined two drug regimen than in the single drug regimen. Higher adverse events were associated with higher baseline microfilarial counts. Adverse events increased by 20% for each increase in microfilarial count of 200 mf(microfilariae) per millilitre.

Discussion:-

The results of the study emphasize that single dose of DEC plus albendazole was more effective in the clearance of *W. bancrofti* from the blood than single dose of DEC regimen. The dual drug regimen is the standard regimen used for mass drug administration for the elimination of lymphatic filariasis. The participants in this study had not received prior treatment for lymphatic filariasis, and all had moderate to high microfilarial counts. Clearance of microfilaremia was observed in all participants who received two drug regimen, and this effect persisted for 3 years. The long persistence of parasite free state prevented further transmission. With respect to microfilarial clearance at 36 months, the two- drug regimen was superior to a single dose of DEC regimen administered once a year for 36 months. Therefore, the two-drug regimen has the potential contribution in the elimination of lymphatic filariasis. DEC (diethylcarbamazine citrate) has both macro and microfilaricidal properties, albendazole has sustained macrofilaricidal properties and it has sterilizing action on the adult worms. Regimens that combine albendazole and DEC have sustained microfilaricidal effect and are the mainstay of eradication of lymphatic filariasis. Reinfection was unlikely because of the increased use of mosquito nets and continued mass drug administration of DEC. Adverse events after initial treatment were more frequent with the two-drug regimen than with the single drug, adverse events were probably triggered by microfilarial death. These findings indicate that the two-drug regimen produces sustained clearance of microfilaraemia in all persons who received the treatment. This point is stressed in this study, as we are aware that incomplete clearance of microfilaraemia contributes to spreading of transmission.

Elephantoid leg:



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