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Role of *Calotropis procera* [ARKA] an ayurvedic drug in treatement of HIV/AIDS patients 10+10

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Abstract

Calotropis procera (Asclepia daceae) popularly known as ARKA possess unique medicinal properties. Its leaves are used in India from ancient times. The plant contains many bioactive compounds of medicinal significance. This prompted me to study its role in the treatment of HIV patients. A (Three to five months) study from june 2006 of diagnosed HIV patients, attending OPD of our centre Arogyadham in 20 patients was undertaken (10 cases in experimental group received three grains powdered leaves of C. procera, with routine ART,AKT, ART+AKT, general &nutritional supportive treatment. Other remaining 10 cases, who also received ART, AKT, ART + AKT, general & multivitamin therapy served as control group). Patients were clinically and systematically examined. They were investigated for routine blood examination, x-ray chest, weight and CD4 counts, weight gain and O.I. (Opportunistic Infection) was done and recorded before and afterwards. The leaves of Calotropis procera which were dried and given in the dosage of grain 3 twice daily to each patient continuously minimum of 3-5 months. These leaves of Calotropis procera were collected from the surrounding area of Falna. This study reveals significant rise in weight gain, CD4 counts and significant decrease in opportunistic infection. Rise in CD4 counts by ayurvedic herbal drug calotropis procera indicated its probable role as antiviral, as an immunomodulator drug , it dose not interact with ART and is compatible and synergistic in action with ART (Zidovudin, Lamivudin and Nevirapine and Stavudin) and AKT therapy it is cheap & non toxic in low doses as used in our study. Should be given under supervision of an authorized person, with a word of cautin. This proves the effect of *Calotropis procera* on HIV- 1 probably bioactive compounds present in the leaves of Calotropis procera are interfering replication of HIV-1 2.86 percent, after 3-5 month period, as compared to base line. However similar pattern is visible in control group but at a relatively lower growth rates of 4.089 surprisingly, this gain in body weight is statistically insignificant in herbal treated groups but significant in control group.

Keywords:

INTRODUCTION

Calotropis procera (Asclepia daceae) popularly known as ARKA possess unique medicinal properties. Its leaves are used in India from ancient times. The plant contains many bioactive compounds of medicinal significance. This prompted me to study its role in the treatment of HIV patients.

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Material & Methods

Eligibility Criteria:

- HIV 1 confirmed patients (Elisa sero- positive)
- Patients from either sex
- Signed informed consent taken
- Pregnancy cases excluded

Study Discontinuation:

- If patients not co- operative
- Development of any acute disease not related to HIV/AIDS during study period.

Doses:

Ayurvedic medicine [herbal] arka /madar/calotropis prosera, grain 3 were administered twice daily for 3 months along with general symptomatic treatment.

Evaluation:

- Clinical findings HB, TLC, LFT, S. creatinine,and X-ray chest.
- Presence or development of opportunistic infection[O.I]
- Weight recordings.
- Specific test CD4 counts

RESULTS

Body Weight:

Results recorded in table 1 and 2, presented detailed analysis in table 3 evident and conclusively showed that there is progressive gain in body weight in herbal treated group.

Table-1. showing Weight of 10 Herbal treated cases

S.No	File No.	Wt in kg (Before)	Wt in kg (after)
1	1	55	56
2	127	41	43
3	277	42	40
4	627	43	42
5	682	42	40
6	726	35	40
7	768	41	41
8	889	70	73
9	925	39	46
10	926	46	46
Mean±S.E.		45.4+3.187	46.7+3.303

Table-2. Showing Weight of 10 control cases

S.No	File No.	Wt.in kg (Before)	Wt .in kg (After)
1	445	49	52
2	547	49	56
3	684	58	59
4	733	47	50
5	758	49	50
6	759	48	50
7	792	46	46
8	906	49	45
9	923	50	50
10	1001	44	51
Mean± S.E		48.9+1.159	50.9+1.3119

CD4 Count:

Observations recorded in table-4,5 and detailed analysis presented in table-6 and 7, shows positive increase in CD4 count is observed in 80 percent in herbal treated group (table 6) as compared to control where the rise in CD4 count I s seen in 60 percent patients only (table 6). Further , data presented in table 7 evidently indicated that overall rise in CD4 rise in CD4 count is to an extent of 26 during exposure to *calotropis procera* leaf powder. This rise is definitely very high as compared to negative rise [drop] in control (ART, AKT, ART + AKT and symptomatic) where respective value is only -5.5 (table-7). If these values are converted to percentage ,figures obtained would be 16.25% and -3.02% respective for herbal and control groups (table7). Further , this rise in CD4 count varied 9.58 % to 229.73%in herbal treated group in comparison to only 0.35% to 66% in control group (table6).Similarly, a drop in CD4 count is noticeable in 40 percent of control group (table7) where this drop ranged from 17.41% to 24.68% However such drop in CD4 count is observed in only 20 percent patients belonging to herbal treated group (table6)wherein drop ranged from 29.22% to 46.03%.

Table 3:-Showing relative gain in body weight in herbal treated and placebo (control) groups

Group	Base – line values	Values (After)		Values of't" between
			% gain	
Herbal Treated (n=10)	45.4± 3.187	46.7± 3.303	2.86	1.378NS .
Control (placebo) (n=10)	48.9± 1.159	50.9± 1.3119	4.089	1.9166*

(Value is Kg., mean±S.E.)
N.S=Not Significant at 5% level of significance
*=significant at 5%level of significance

Table-4. CD4 count of 10 r cases during herbal period.

SN	FILE NO	Before Treatment	After Treatment	DURATION
1	1	121	139	3months
2	127	670	1078	3months
3	277	126	68	4months
4	627	308	340	4months
5	682	219	155	5months
6	726	125	222	5months
7	768	37	122	3months
8	889	167	183	4months
9	925	153	189	3months
10	926	538	1011	4months
Mean±S.E.		160+65.84	186+120.63	Median Diff=26

Opportunity Infection:

Observations recorded in table 8 and 9, and detailed analysis presented in table 10 did reveal a highly significant decline in opportunity infection (p>0.01), after 5 months period in both the group (table 10). However ,results of herbal treated group reflected regular curbing trend in O.I (table 10) though it is statistically insignificant when compared to base line data.

Table-5. Showing CD4 count of 10 control cases

s.No	File No.	Before study	After study	Duration
1	445	107	86	3months
2	547	198	226	5months
3	684	239	180	5months
4	733	278	279	4months
5	758	166	173	3months
6	759	560	461	3months
7	792	57	71	4months
8	906	50	83	3months
9	923	224	185	4months
10	1001	94	106	4months
Mean±S.E.		182+48.432	176+38.32	Median Diff=5.5

Further it is noticed that in ART ,ART + AKT, AKT (placebo) medicines attacked O.I. speedily at first instance (table10) where precent reduction in transformed values is 75.55206% as compared to herbal group wherein this reduction is only 65.48212% at termination of 3 months period. Subsequently, between 3 months and 6 months periods, percent reduction in O.I. remained at 54.58 in placebo group where as *Calotropis procera* treated group provided better reduction in O.I.i.e.75.44 percent. However at termination of study , percent reduction in O.I.in both the group is around 80 percent (table10). this evidently revealed that herbal therapy has no adverse affect, is non –toxic and compatible with ART, AKT and ART+AKT.

Discussion

Rise in CD4 count by Ayurvedic herbal drug calotropis procera there by indicate its interfering effect on replication of HIV [virus] **7-9,**Improvement seen in O.I. [opportunist infection] by calotropis procera further correlates its use in various diseases as used in traditional medicine,further experimental studies conducted on laboratory animals establish its analgesic and inflamatery, antibacterial -26 action, anti malarial 19-21, anti microbial 26 and antihelmithic anti diarrhoeal25 anti pyretic-24 wound healing -17, anti cancer and its LD50 5 are established. It dose interact or incompatible with calotropis procera leaves use with ART [zindovidin, lamuvidin & nevirepin] and AKT so it is compatable and may in combined with HAART Therapy as it has synergesic effect.

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Adverse effect:

No demonstrable side effects or allergic reaction were noted by Calotropis procera.

Table 6. Showing rise in CD4 count in herbal treated and control group (Values are mean ±S.E.)

S.No	Characters	Control group	Herbal Treated group
1.	Positive rise in CD4 count	60%	80%
2.	Drop in CD4 count	40%	20%
3.	Variation in –ve(drop)CD4 count	17.41 to 24.68%	29.22 to46.03
4.	Variation in +ve rise in CD4 count	0.35% to 66%	9.22% to229.73%
5.	% distribution of +ve rise in CD4count		
5a.	0 to10%	33.33%	25%
b.	11 to30%	50%	25%
c.	31 to50%	-	-
d.	51 to 100%	16.67%	37.5%
e.	101 to 300%	-	-
f.	Up to1000%		
6.	% distribution of –ve (drop) CD4 count		
6a.	0 to 10%	-	-
b.	11 to 30%	50%	100%
c.	31 to 50 %	50%	

Table-7. Revealing changing pattern of CD4 count in placebo (control) and herbal treated group.

S.No. / Group	Character CD4 Count				Values of Wilcoxion sign ranked T Before experiment v/s after 5 months	Significance/Not Significant
	Baseline [Median+S.E.]	**During Exposure [Median +S.E.]**	**Total increase**	**% increase**		
Herbal (10cases)	160+65.84	186+120.63	26	16.25%	11	NS at 5%
Control (10cases)	182+48.432	176+38.32	-5.5	-3.02	12	NS at 5%

N.S.=Not Significant at 5% level of significance

Table-8:- opportunstic infection in 10 r cases during herbal period

O.I.	basal	basal proportion[p1]	Ars[p1]	After3 months	Proportion After 3[p2]	Ars[p2]
Weight Loss	7	70%	0.7754	2	20%	0.20136
Fever	7	70%	0.7754	1	10%	0.10017
Loose motions	3	30%	0.30469	0	0%	0
Cough	4	40%	0.41152	0	0%	0
Pul.T.B	-	-	-	-	-	
lyphadenopath	-	-	-	-	-	
Itching	3	30%	0.30469	2	20%	0.20136
fungal Infeon	-	-		-	-	
+weakness	3	30%	0.30469	1	10%	0.10017
Anaemia	0	0%	0	1	10%	0.10017
Psychology	-	-		-	-	
C.N.S.	-	-		-	-	
Mean +S.E.		38.57%+9.37%	0.4109+0.1056		10%+3.086	0.1005+0.0311

Table-9. Opportnistic infection in 10 control cases

O.I	basal	Basal Proportion[p1]	Ars[p1]	A.fter 3months	Pr0portion After3[p2]	Ars[p2]
Weight Loss	08	80%	0.9273	1	10	0.10017
Fever	07	70%	0.7754	1	10%	0.10017
Cough	04	40%	0.41152	1	10%	0.10017
Diarrhoea	03	30%	0.3046	1	10%	0.10017
Pul.T.B	-	-	-	-	-	
L.Gland	01	10%	0.10017	0	0%	0
Itching	02	20%	0.20136	1	10%	0.10017
FungalInfection	-	-	-	-	-	-
Weakness	02	20%	0.20136	4	40%	0.1452
Anaemia	03	30%	0.30469	2	20%	0.20136
Psychology		-	-	-		-
C.N.S	-	-	-	-		-
Mean±S.E.		37.5%+8.81%	0.4033+0.1040		13.75%+4.19%	0.1392+0.0433

Table-10. Indicating percent progressive reduction in opportunity infection levels at various intervals

Group	Base –line values	Values(After)	Values of' t" between
Herbal treated (n=10)	0.4109±0.1056	0.1005±0.0311	3.048731**
Control (placebo)(n=10)	0.4033±0.1040	0.1392±0.0433	2.215142

**=p≥0.01, high level of significance; *= p≥0.05, level of significance

CONCLUSION

Rise in CD4 count by ayurvedic herbal druge *calotropic procera* therapy indicates its role asantiviral. It probably inhibits and/ or checks replication of HIV. It is probably a good immune –modulator drug as compared to ART treated control group where low rise in CD4 count is observed.

It does not interact with ART and it is compaptible and synergistic in action with HAART therapy (Zidovudine, Lamivudine, and Nevirapine) and AKT therapy.

It is cheap and non toxic if given in low doses. It is available in arid and semi arid areas of country but requires administration under supervision of authorized person.

Improvement seen in O.I. (opportunistic infection) probably correlate this drug Calotropis procera as a broad spectrum drug like antiviral, antibacterial, antihelmentic, in HIV/AIDS cases.

It can prove as effective alternate/supporting Ayurvedic (herbal) medicine but requires long term research in pharmacological events to commensurate with its role as effective immune- modulator and identify chemicals and related factors responsible to produce similar results.

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As per disease stage of the patients, they were referred to advanced /tertiary center as per N.A.C.O. and W.H.O.norms.

General information in respect of age, sex, cast, job/work, economic status was also recorded for each patient.A minimum fortnightly visit of patients was made mandatory to accomplish the study. By and large, all the patients were above 20 years of age, as for as possible equal sex distribution in each group was tried. Pregnant females were discarded. Date so collected were subjected to statistical analyses following Snedecor and Cochran, 1967. Percentage values were converted to Arcsin for comparisons.

.Competing interests

The authors have declared that no competing interests exist.

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