

Laboratory Investigation of HIV+/AIDS Patients Supplemented with EM-X

Maitree Suttajita), Pongsiri Prathnadi^{a)}, Somlakana Pongsadit^{b)},
Tapee Jaytawan^{c)}

a)Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand

b)EM Research Organization Thai, Bangkok, Thailand

c)Nonchangkuen, Lamphun, Thailand

Introduction

AIDS (acquired immunodeficiency) is a group of fatal diseases caused by human immunodeficiency virus (HIV) infection and followed by opportunistic infections. During the viral infection and the progression to AIDS, the patients have worsening effects from environmental factors existing inside and outside the body (1). The cofactors include free radicals, toxic chemicals, emotional stress and immunotoxic compounds leading to an oxidative stress. The antioxidative capacity of patients including antioxidant vitamins, glutathione and essential minerals such as zinc and selenium significantly decrease (2-8). The EM-X beverage is a refreshment drink extracted from rice bran and seaweeds after the fermentation with Effective Microorganisms (EM). The EM-X contains potent antioxidants, minerals, and bioactive natural substances, e.g. NAD, peptide, and some amino acids such as L-alanine and L-glutamine. It will be hypothesized that EM-X drink like other antioxidant vitamins should be able to protect and reverse the oxidative damage in HIV+/AIDS patients. It is our aim in this investigation to study the effect of EM-X supplementation along with healthy lifestyles will slow down the progression from HIV+ infection to AIDS or reverse the sickness and promote the quality of life of the patients.

Material and Methods

EM-X beverage was kindly given by EMRO, Thailand. The HIV+/AIDS patients (N = 41) to be studied included 8 males and 33 females, 21 – 54 years. They voluntarily applied for the clinical and laboratory investigation by taking EM-X supplement regularly every for 6 months. The patients were divided into 3 groups depending on their clinical manifestation: Group A (N = 27) with HIV+ without any symptoms, Group B(N = 8) HIV+ with clinical evidence of skin manifestation and Group C (N = 6) HIV + with clinical evidence of opportunistic infection such as pulmonary tuberculosis, pneumonia, diarrhea, lymph node enlargement, etc.

Trolox equivalent antioxidant capacity (TEAC) in serum of the patients was measured by in vitro ABTS method (9).

One patient developed skin rash after taking EM-X continuously for 3 months. There were three patients who died, one case from heart problem, another from food poisoning and the other from severe infection.

Hemoglobin, hematocrit, white blood cell count, differential counts (CD₄ and CD₈), and viral load were examined at the beginning of the clinical studies and three months and six months after starting EM-X.

Results and Discussion

The lab test total complete blood count in HIV+/AIDS patients were done on Nov. 1, 2000 and Feb. 2, 2001 (shown in table 1). Their original hemoglobin ranged from 7.8-16.8 g% in the first visit and after 3 months ranged from 7.5-16.3 g%; their hematocrit values were from 24-53% at the first visit became 25-48% after 3 months. The white cell counts were mostly in a normal range, 5000-14700 cells/cu.mm except one person (No. 22, *Umporn K.*) who had a very low level at 42 cells/cu.mm. At the first visit and died one month later. However, the lymphocyte counts of all patients greatly varied from the range of 9-53 cells/cu.mm. During the first 3 months. While 66% of the patients showed decrease in hemoglobin after 3 months, 90% did after 6 months. Also 60% of the patients showed decrease in hematocrit after 3 months and so did 80% after 6 months.

For the white blood cell counts, 63% revealed increase after 3 months, 90% did after 6 months. The number of lymphocyte increased for 70% of the patients after 3 months and definite increase for 77% after 6 months. The values of CD₄ were found increased 56% of the patients after 3 months and 47% after the 6 months. CD₈ values were found increased 48% and 51% after three and six months respectively.

Table 2 shows the viral load and its logarithm of HIV+/AIDS patients during three months of treatment. There were more cases with decreasing viral load than the increasing ones. The viral load were examined in all cases and found increasing for only 31% and 73% after 3 months and 6 months respectively.

Table 3 shows varying levels of CD₄ + (9-1170 cells/μl) and CD₈+ cells ranged from 0-1837 cells/μl in their first visit. Comparing between the first visit and third month, CD₄+ cells counts in percentage and average increased from 14.8% to 15.1% and from 249.7 to 308.1 cells/μl respectively. The average CD₄+ / CD₈+ ratios tend to be increased from 0.81 to 0.85. The increasing change to these laboratory parameters was a good sign for immune function.

The average TEAC in normal thais (N = 10) is about 2.26 mmole/ml. at the beginning (Nov. 1, 2000), the average TEAC level of HIV=/AIDS patients (N = 39) was 1.86 ± 0.19 mmole/ml, which is much lower than the normal value. (See Table 4.). Although after EM-X supplementation for 3 months, the TEAC value was 1.81 ± 0.32 mmole/ml, about 42.3% (11/26) of the patients increased after 3

months and about 34.7% (9/26) decreased. However, after 6 months, the values decreased to be 1.65 ± 0.20 mmole/ml. only 20% (7/35) significantly increased remained high level compared to the beginning values. (Without EM-X supplementation the patients would have shown much lower TEAC values.

Conclusion

The results of blood test have shown the increasing number of white blood cell count, lymphocyte CD₄ and CD₈, all of which indicate that the drinking of EM-X enhanced the patient's immune system.

The low Hb and Hematocrit are dependent upon the limitation of low protein of animal sources intake. Although the definite increase in viral load for many patients means that EM-X was not producing antiviral action, the improvement of the clinical condition by EM-X may be due to their enhanced immune system rather than antiviral.

It is suggested here to follow up the clinical condition of HIV+/AIDS patients after EM-X drinking for at least 12 months period to confirm the clinical condition and to prove the persistence of improved immune system by measuring the number of Natural Killer Cell (NK cell) at the end of nine month and twelfth months.

Table 1 Blood cells count in HIV+/AIDS patients on Nov. 1, 2000 (before ME-X) and Feb. 2, 2001 (after EM-X)

Pat No.	Hemoglobin		Hematocrit		WBC		Lymphocytes	
	Before EM-X	After EM-X	Before EM-X	After EM-X	Before EM-X	After EM-X	Before EM-X	After EM-X
1	8.9	8.9	30	29	5000	5100	44	36
2	12.9	13.1	40	40	6100	6300	29	27
3	12.2	11.2	37	35	6400	4700	15	31
4	12.8	11.1	35	34	3500	4600	8	28
5	12.8	11.5	38	36	8000	6400	31	39
6	10.4	11.1	31	33	6000	7000	28	31
7	12.8	n	37	n	6100	n	28	n
8	9.7	n	32	n	7000	n	41	n
9	11.8	10.4	35	33	7500	7100	20	19
10	12.4	11.6	39	36	5000	6400	22	30
11	13.2	n	38	n	10200	n	13	25
12	8.6	8.4	26	27	4600	6100	23	25
13	12.8	13	37	38	5100	6500	23	31
14	10.6	10.1	33	33	4200	4600	24	38
15	11.8	12.2	37	38	5500	8200	44	15
16	13	13.7	39	41	8500	8100	32	24
17	13.1	11.6	39	36	5500	3100	20	22
18	7.8	7.5	24	25	2700	3900	0	15
19	11.3	10.2	36	33	6400	6500	10	25
20	14.7	10.2	44	32	6000	4700	28	19
21	10.3	10.3	33	33	4200	4800	23	40
22	11.4	10.1	36	32	6300	7900	24	28
23	9.1	Died	27		42		11	
24	10.5	10.5	34	34	5500	5700	17	33
25	13.4	12.7	39	39	10000	12100	26	26
26	11.4	10	36	31	5100	10900	15	9
27	12	11	37	35	5400	7200	6	9
28	16.6	16.3	53	48	11300	9200	15	26
29	11.9	10.6	35	34	5500	5400	27	37
30	13.3	12.1	40	37	5500	6500	22	20
31	10.4	10.8	32	33	3800	4000	36	53
32	13	12.8	40	40	10800	9300	17	48
33	12.8	n	39	n	4300	n	30	n
34	10.8	10.8	34	33	3800	4000	36	53
35	14.9	n	46	n	9300	n	15	n
36	10.3	n	33	n	6000	n	16	n
37	13.4	12	39	35	4900	4200	31	36
38	11.8	11.2	36	35	14700	5100	48	9
39	12.6	11.9	38	36	5600	5100	20	25
40	12.5	12.3	38	38	7600	8800	42	45
41	n	7.5	n	25	n	5800	n	35

Note: n = not measured.

Table 2 Viral load and its logarithm in HIV+/AIDS patients during 3 months of EM-X supplementation

(Nov. 1, 2000 to Feb. 2, 2001)

Pat No.	Before EM-X use		After EM-X use	
	HIV RNA (cpies/ml)	Log	HIV RNA (cpies/ml)	Log
1	162,857	5.21	107,096	5.03
2	1,275	3.11	8,477	3.94
3	123,905	5.09	<400	
4	215,138	5.33	105,489	5.02
5	16,218	4.21	<400	
6	8,134	3.91	22,273	4.35
7	117,740	5.07		
8	<400			
9	570,419	5.76	160,962	5.21
10	33,956	4.53	34,876	4.54
11	38,519	4.59		
12	342,184	5.53	111,360	5.05
13	154,257	5.19	85,968	4.93
14	80,238	4.91	79,385	4.9
15	42,254	4.63	72,170	4.85
16	<400		<400	
17	108,967	5.04	135,637	5.13
18	302,538	5.48	24,730	4.39
19	73,300	4.87	<400	
20	>750,000		488,871	5.77
21	11,452	4.06	4,866	3.69
22	8,728	3.94	1,884	3.28
23	>750,000			
24	7,391	3.78	2,249	3.35
25	7,181	3.86	3,437	3.54
26	522,441	5.72	38,008	4.58
27	70,709	4.85	12,768	4
28	<400		<400	
29	120,150	5.08	77,794	4.89
30	86,085	4.93	98,991	5
31	158,670	5.2		
32	27,968	4.45	44,622	4.65
33	<400	23		
34	<400		135,837	5.13
35	127,232	5.1		
36	86,540	4.94		
37	100,127	5	82,447	4.92
38	<400		33,079	4.52
39	58,831	4.77	120,304	5.08
40	38,605	4.59	48,563	4.69
41			31,903	4.5

Table 3 Levels of CD₄ and CD₈ cells in HIV+/AIDS patients during 3 months of EM-X supplementation (Nov. 1, 2000 to Feb 2001)

Pat No.	CD ₄ (cell/μl)		CD ₈ (cell/μl)		CD ₄ /CD ₈ ratio	
	Before EM-X	After EM-X	Before EM-X	After EM-X	Before EM-X	After EM-X
1	198	129	1452	1157	0.14	0.11
2	407	365	1008	987	0.4	0.37
3	256	233	800	685	0.32	0.34
4	11	39	148	618	0.08	0.06
5	471	474	1786	1722	0.26	0.28
6	538	616	655	945	0.82	0.65
7	307	n	734	n	0.42	n
8	344	n	1837	n	0.49	n
9	45	27	930	944	0.05	0.3
10	253	403	583	979	0.43	0.41
11	30	n	9.2	n	0.01	n
12	11	70	667	1156	0.02	0.01
13	211	383	587	1108	0.36	0.35
14	101	140	716	1224	0.14	0.11
15	411	265	1016	686	0.4	0.39
16	1170	875	734	369	2.05	2.37
17	11	7	946	505	0.01	0.01
18	0	6	0	135	0.04	0.04
19	45	146	352	861	0.13	0.17
20	67	36	991	598	0.07	0.06
21	145	307	473	960	0.31	0.32
22	575	863	559	863	1.03	1
23	9	Died	342	Died	0.03	Died
24	196	470	468	922	0.42	0.51
25	832	1007	1196	1416	0.7	0.71
26	61	59	513	706	0.12	0.08
27	68	143	165	919	0.24	0.16
28	847	1124	322	454	2.63	2.47
29	187	400	580	1079	0.32	0.37
30	375	403	629	624	0.6	0.65
31	70	Died	459	Died	0.04	Died
32	18	45	588	1607	0.03	0.03
33	193	n	529	n	0.37	n
34	82	191	917	1336	0.09	0.14
35	195	n	600	n	0.33	n
36	9.6	n	633	n	0.02	n
37	106	106	987	922	0.11	0.11
38	384	347	1308	1163	0.29	0.3
39	179	179	392	485	0.46	0.37
40	638	634	1564	1861	0.41	0.34
Average	249.7	308.1	751.7	888.9	0.81	0.85

Note: n = absent and no data recorded

Table 4 Trolox equivalent antioxidant capacity (mmole/ml) in serum from HIV+/AIDS during 6-months EM-X supplementation (Nov.1,2000 to May.2,2001)

No.	Patients' name	Clinical Group	Start (Before EM-X use)	After 3 Months	After 6 Months
1	Mrs.C.S	A	1.60	2.05	1.66
2	Mrs.J.Y	A	1.73	1.46	1.61
3	Mrs.P.R	A	2.03	1.52	1.87
4	Mrs.N.T	A	2.00	1.88	
5	Mrs.S.J	A	1.86	2.05	1.51
6	Mrs.B.K	A	1.76	2.05	1.36
7	Miss.N.K	A	1.81		
8	Mr.M.T	C	1.59	1.88	1.64
9	Miss.T.A	A	1.83		1.56
10	Mrs.K.G	C	1.77		2.17
11	Mrs.P.N	B	2.05		1.58
12	Mrs.L.T	A	1.77	2.19	1.64
13	Mrs.J.Y	B	1.89	1.86	1.56
14	Mrs.P.F	A	2.08	2.18	1.52
15	Mrs.S.I	B	1.90	1.86	1.97
16	Mrs.V.Y	B	2.15	1.63	1.51
17	Mr.S.Y	C	2.05		1.61
18	Mrs.A.P	B	2.07	1.93	1.66
19	Mr.N.P	A	2.06	1.54	1.69
20	Mrs.S.T	A	1.60	0.96	1.82
21	Mrs.	A	1.85	2.38	1.47
22	Mrs.R.T	A	1.98	1.99	1.75
23	Miss.A.P	A	1.86	1.83	1.74
24	Mrs.S.K	A	1.79	1.60	1.61
25	Mrs.S.T	A	1.61	2.07	1.72
26	Mr.N.T	A	1.65	1.77	1.52
27	Mrs.P.R	B	2.42	1.72	1.56
28	Mrs.	A	1.94	1.64	1.73
29	Mr.R.C	B	1.49		1.58
30	Mrs.M.T	A	1.78		
31	Mrs.P.J	B	2.17		1.98
32	Mr.S.M	A	1.69		
33	Mr.S.J	A	2.00		
34	Mrs.Y.P	A	1.69	1.36	1.19
35	Mrs.N	A	1.75		1.38
36	Mrs.B.P	A	1.65	2.29	1.89
37	Mrs.R.K	A	1.89	1.44	1.60
38	Mrs.P.T	A	1.68		1.81
39	Mrs.A.C	B	1.90		
	Average		1.86	1.81	1.65
	S.D		0.19	0.32	0.20

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