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Medicinal Synthetic Aluminum-Magnesium Silicate $\{Al_4(SiO_4)_3 + 3Mg_2SiO_4 \rightarrow 2Al_2Mg_3(SiO_4)_3\}$ —A Highly Active Anti-Retroviral Medicine

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Abstract

Medicinal synthetic Aluminum-magnesium silicate (MSAMS), which has inhibited Human immune deficiency virus (HIV), *in vitro*, was used for trial-treatment of HIV/AIDS patients. Their plasma were tested for viral loads (VL): before and repeatedly during the treatment. The regimen was: MSAMS (50 mg/kg), MSAMS-stabilized Ampicillin trihydrate (7.5 mg/kg) and immunace extra protection®. After 4 weeks, it was reduced to 50 mg/kg (MSAMS) and the immune stimulant. When VL decreased bellow 50/ml, the treatment continued, 4 weeks before stopping. Mean-VL of four patients increased (P = 0.006) from 498.50 ± 33.37 to 1,072.50 ± 184.55, after 3.75±2.06 weeks and decreased (P = 0.040) to 407.33 ± 297.27 (18.29%) when the treatment-duration increased to 6.67 ± 2.31 weeks. Prolonging the duration to 12.00 ± 2.83 weeks led to 98.68% decrease of mean-VL of four other patients, from 24,250.00 ± 15,939.34 to 321.00 ± 229.38(P = 0.045). Two HIV positive persons treated for 4 weeks after their VL reduced bellow 50/ml have remained healthy, 10 and 16 months respectively, without routine antiretroviral medication.

Keywords

MSAMS-*Nanoparticles*, Unmasking "Hidden Infections", Moping-Out HIV, Access to All Organs/Tissues

1. Introduction

Inhibition of attachment of viruses to cells of their hosts is one of the mechanisms of actions of antiviral medi-

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cines [1] and molecules of Aluminum-magnesium silicate (AMS) consist of *Nanoparticles* [2] [3] which have negative electrical charges on their surfaces and positive charges on their edges while viruses have either net positive electrical charges or net negative charges. HIV has net positive electrical charges [4]. So, AMS can inhibit attachment of HIV to cells of its hosts. The AMS is already in use as a medicine and results of toxicity tests confirm that it is very safe [5]. That means, it can be used as antiretroviral medicine.

The negative and positive electrically charged ends which *Nanoparticles* of AMS have, give it broad-spectrum antiviral activities, because their surfaces inhibit attachment of positively charged viruses to cells, while their edges inhibit negatively charged viruses. When significant percentage of population of a virus that has infected an animal or a man is inhibited by AMS, immunity completes termination of the infection. Ultra-small size of the particles makes it possible for them to pass physiological barriers, to gain access to viruses in every organ/tissue and in every body-system. By mopping out HIV, AMS may inhibit millions of new particles of the virus, usually released from each infected cell, from establishing their own foci of the infection. Thus, HIV-infections would no longer progress to the acquired immune-deficiency syndrome (AIDS) stage. When AIDS is prevented, immunity clears HIV infections [6].

Nigeria does not have AMS, as a natural resource, but there is abundance of deposits of Aluminum silicate $\{Al_4(SiO_4)_3\}$ and Magnesium silicate $\{Mg_2SiO_4\}$ in the country. These two minerals are also medicines that are already being used for treatments [7]. To get a purer form of AMS $\{Al_2Mg_3(SiO_4)_3\}$, the two medicinal minerals were reacted [8]. Dextrose monohydrate was formulated with the *medicinal synthetic* AMS (MSAMS), to carry its molecules, by active transport [9], across mucous membranes of the gastro-intestinal tract, into blood which carries them to all organs/tissues and to all body systems.

The MSAMS has inhibited HIV, *in vitro* [10] and cured animals infected with viruses of *Paramyxoviridae*, *Birnarviridae* and *Parvoviridae* families [11]-[13]. A histopathologic study revealed that it inhibited activities of *Canine parvovirus* in organs of infected dogs [12]. The medicine has therefore been on repeated clinical trials, for antiretroviral effects.

2. Materials and Methods

For present study, a formulation [14] of the MSAMS and Ampicillin trihydrate (Antivirt A®) and a formulation of the MSAMS alone (Antivirt B®) were used to treat eight patients. Each of the patients had to volunteer for the clinical trial by applying through his/her physician. They had their plasma tested for HIV viral load (copies of RNA/ml) before the treatment. The test for viral loads was repeated several times, on each patient, during the treatment. For the first 4 weeks, they were treated, daily, with 50 mg/kg (MSAMS), 7.5 mg/kg (MSAMS-stabilized Ampicillin trihydrate) and Vitabiotics' immunace extra protection® (1 tablet per day). Thereafter, they were on 50 mg/kg (MSAMS) and the immune stimulant, only. When viral load of a patient reduced bellow 50/ml the treatment was continued for additional 4 weeks and then stopped.

Means of viral loads of the patients: before the clinical trial, when the viral loads were observed to have increased and when the viral loads started to decrease were compared for statistical differences, by Analysis of variance. Also, mean-duration of the treatment that led to the increase in viral loads and mean of the duration that caused it to start decreasing were calculated. Finally, mean of viral loads of HIV/AIDS patients before the MSAMS-treatment and the mean when the treatment progressed were tested for statistical difference, by the *Students' T-test*. Differences in means of viral loads of the different groups were accepted as significant only where the P value was ≤ 0.050.

3. Results

Viral loads of four of the patients (**Table 1**) increased ($P = 0.006$) from 498.50 ± 33.37 to 1,072.50 ± 184.55 (115.29%) after treatment for a mean-duration of 3.75 ± 2.06 weeks and then reduced ($P = 0.040$) to 407.33 ± 297.27 (18.29%) when the treatment-duration increased to 6.67 ± 2.31 weeks. For four other patients (**Table 2**) whose mean treatment-duration increased further to 12.00 ± 2.83 weeks the rate of viral load-reduction improved ($P = 0.045$) to 98.68% (24,250.00 ± 15,939.34 to 321.00 ± 229.38).

4. Discussion

Increases in HIV titre, when HIV-positive plasma were treated with the MSAMS, *in vitro* [10] and the increases

Table 1. Initial increases and decreases in viral loads of HIV-patients treated with the Medicinal synthetic Aluminum-magnesium silicate.

	Before treatment	Increase (weeks of treatment)	Decrease (weeks of treatment)
	500	1000 (1)	70 (4)
	518	936 (6)	-
	451	1009 (4)	631 (8)
	525	1345 (4)	521 (8)
Mean	498.50 ± 33.37[a]	1072.50 ± 184.50[b] (3.75 ± 2.06)	407.33 ± 297.27[c] (6.67 ± 2.31)

Table 2. Viral loads of HIV-patients treated with the Medicinal synthetic Aluminum-magnesium silicate.

	Before treatment	After treatment (Duration).
	4000	1000 (8)
	1000	40 (8)
	70,000	200 (12)
	22,000	44 (20)
Mean	24,250.00 ± 15,939.34	321.00 ± 229.38 (12.00 ± 2.83)

in viral loads observed in this *in vivo* study suggest that the MSAMS destroys infected cells to unmask "hidden infections". The subsequent reductions in titres and in loads of the virus suggest that the AMS-*Nanoparticles* also mop out extra-cellular HIV.

Increase in rate of reduction of viral load, from 18.28% to 98.68%, when duration of treatment was increased from 6.67 ± 2.31 weeks to 12.00 ± 2.83 weeks suggests that population of HIV mopped out by MSAMS-*Nanoparticles* increases with prolongation of duration of the medication. Reduction of the viral loads below 50/ml qualifies the MSAMS as a *highly active antiretroviral* therapy (HAART).

That the MSAMS, alone, achieved HAARTs' effect which is effect of combinations of three or more antiretroviral therapies [15] may be because: AMS-*Nanoparticles* mop out HIV particles by electrostatic attraction between their negatively charged surfaces and positive charges on the virus; *Nanoparticles* cross physiological barriers. So, the MSAMS has access to extracellular HIV and HIV-infected cells, both in the blood and in all organs/tissues; *Nanoparticles* have affinity for abnormal cells [3] while AMS enhances disintegration of drugs [2]. So, the MSAMS may also have destroyed infected cells to unmask "HIV hidden in cells"; The MSAMS may have enhanced efficacy of Ampicillin trihydrate so that secondary infections were more effectively treated [16]-[21]; The MSAMS makes lower doses of drugs (75%) more effective than 100% of the doses [22] [23]. Use of a lower dose (7.5 mg/kg) for treatment may have minimized side effects of Ampicillin trihydrate so that immune systems of the patients functioned optimally. Enhancing immune responses helps to terminate HIV infections [6].

Two of the patients whose viral loads reduced to 40/ml and 44/ml and their treatment was continued for 4 weeks after the test, have remained clinically healthy, without antiretroviral medication for 16 months and for 10 months, respectively. It remains to confirm their HIV status by an antigen test instead of testing for antibodies, since antibodies can remain in blood, long after termination of viral infections.

5. Conclusion

Since the ***Medicinal synthetic Aluminum-magnesium silicate***: is a highly active anti-rethroviral therapy; unmasks "hidden infections"; acts both in blood and on organs; mops out more HIV as duration of treatment is prolonged, what is needed to achieve cure for HIV/AIDS may be to continue the treatment long enough after viral loads of patients reduce to <50/ml (by old viral load technique) or to <20/ml (undetectable) by the new technique.

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