



RESEARCH ARTICLE

Frequency of Anti-HCV, HBsAg, HIV1-p24 Antigen, Acid Fast Bacilli and *Plasmodium* spp., in Herbal Home and Hospital Patients with Elevated TNF α (≥ 5.0 pg/ml) in Saki, West Nigeria

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Abstract

Infectious agents and chemical substances can trigger the production and the release of cytokines. To determine the pattern of infectious agents in herbal homes patients with elevated TNF α (≥ 5.0 pg/ml) in Saki – West-Nigeria. The subjects include patients with elevated TNF α (≥ 5.0 pg/ml) in 15 herbal homes (n=23 ; aged 5-69 years; males – 13 ; females – 10) and patients with elevated TNF α in 3 major hospitals (n = 32; aged 6 -67years; males – 12 ; females - 20). Plasma TNF α , anti-HCV, HBsAg and HIV1-p24 antigen were determined by ELISA, *Plasmodium* spp., by Giemsa thick film staining and Acid Fast Bacilli by Ziehl-Nelson staining. The frequency of infectious agents obtained in the patients include 4.3 %(1) anti-HCV; 17.4% (4) HBsAg; 4.3 %(1) HIV1-p24 antigen; 17.4% (4) *Plasmodium* spp.; 8.7 %(2) Acid Fast Bacilli and 4.3 %(1) HBsAg + *Plasmodium* spp., in patients of herbal homes and 6.3 %(2) anti-HCV; 9.4% (3) HBsAg; 3.1 %(1) HIV1-p24 antigen; 15.6% (6) *Plasmodium* spp., 0%(0) Acid Fast Bacilli and 3.1 %(1) HBsAg + *Plasmodium* spp., in patients of the three major hospitals. The frequency of those with 5.0 – 6.0 pg/ml TNF α (65.2% (15)) was more than those whose TNF α was between 6.1 – 6.8 pg/ml (34.8% (8) in herbal home patients while the frequency of those with 5.0 – 6.0 pg/ml TNF α (40.6%(13)) was lower than those whose TNF α was between 6.1 – 6.8 pg/ml (59.4% (19)) in hospital patients. The pattern of the infectious agents was more in herbal home patients with 5.0 – 6.0 pg/ml TNF α than those with 6.1 – 6.8 pg/ml TNF α while in hospital patients it was more in those with 6.1 – 6.8 pg/ml TNF α than those with 5.0 – 6.0 pg/ml TNF α . The overall frequency of the infectious agents was more in herbal homes patients (58.5%(13)) than 37.5%(12) obtained in hospital patients. The frequency of viral immunochemical biomarkers, Acid Fast Bacilli and *Plasmodium* spp., was more in herbal home patients than the patients recruited from the hospital which varies with the TNF α range.

Keywords: Anti-HCV, HBsAg, HIV1-p24 antigen, Acid Fast Bacilli, *Plasmodium* spp., herbal homes patients, elevated TNF α .

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INTRODUCTION

Herbal treatment involves the administration of dietary supplement in form of tablets, capsules, powders, teas, extracts, and fresh or dried plants. People believe the treatment is safe and natural. Plants are basis for medical treatments in human history. Pharmaceutical drugs are made from many plant-derived compounds. According to World Health Organization (WHO) about 80 percent of the population in Asian and African countries use herbal medicine for some aspect of primary health care^{1,2}. About 25% of modern drugs used in the United States were derived from plants^{1,2}. At least 7,000 medical compounds in the modern pharmacopoeia are derived from plants. Out of the 120 active compounds currently isolated from plants and used in modern medicine currently, 80% show a positive correlation between their modern therapeutic use and the traditional use of the plants from which they are derived^{1,2}.

Herbal treatment is more prevalent in patients with cancer, diabetes, asthma, viral infection, Plasmodiasis, hypertension/hypercholesterolemia and end-stage renal disease. Multiple factors such as gender, age, ethnicity, education and social class are also shown to have association with prevalence of herbal remedies use^{1,4}. The most common administration of herbs in treatment in Nigeria is through drinking of raw liquid extract or aqueous extract through boiling⁵. Herbal treatment can cause adverse effects due to possible adulteration, inappropriate formulation, administration or lack of understanding of plant and drug interactions^{6,7}.

The practice of herbalism entails that herbalists must learn wild-crafting, cultivation of herbs, diagnosis and treatment of ailments, preparations and dispensing of herbal medications⁸. Non-hygeinic and unethical practices by some herbalists could bring about cross infection and contaminations during product preparation^{8,9}.

Tumor necrosis factor (TNF α) is one of the cell signaling proteins known as cytokine involved in systemic inflammation; It is a cytokine that make up the acute phase reaction. It is produced by activated macrophages, CD4+ lymphocytes, NK cells, neutrophils, mast cells, eosinophils, endothelial cells, cardiac myocytes, adipose tissue, fibroblasts and neurons. It acts

as an endogenous pyrogen, it induces fever, apoptotic cell death, cachexia, inflammation, inhibits tumorigenesis and viral replication^{10,11}.

It acts on organ and system as proinflammatory cytokine to stimulate the release of corticotropin releasing hormone (CRH), suppressing appetite, induce fever, stimulate acute phase response which causes increase in C-reactive protein, stimulates phagocytosis, regulates bitter taste perception^{12,13}. A local increase in concentration of TNF will brings about signs of Inflammation such as : heat, swelling, redness, pain and loss of function. The synthesis and release of TNF α are trigger by presence of infectious agents and chemicals that result in inflammation especially hepatitis^{12,13}.

Inappropriate use of herbs, some phytochemicals, phytonutrients and infectious agents can induce inflammation^{12,13}. This work was therefore designed to determine the Viral immunochemical frequency of anti-HCV, HBsAg and HIV1-p24 antigen including pattern of other infectious agents in herbal homes patients with elevated TNF α (≥ 5.0 pg/ml) in Saki – West-Nigeria

MATERIALS AND METHODS

Study area

The study area is Saki-West local government area at the Northern part of Oyo state in Nigeria. It is a semi-urban area that shares border with Burkina faso, Kwara state, Saki-East and ATISBO local government areas in Nigeria. Many of its Inhabitants practice herbal medicine personally or by visiting herbal homes. It hosts 244 Racee battalion of Nigeria army, Baptist School of Nursing, School of Medical Laboratory Technology, Muslim Hospital School of Basic Midwifery, The Oke-Ogun Polytechnic, Baptist Medical Centre, Oyo State Hospital, Muslim Hospital and Oyo state Technical College.

Study population

This include patients with elevated TNF α (≥ 5.0 pg/ml) who volunteered themselves in 15 herbal homes (n=23; aged 5-69 years; males – 13; females – 10) and also patients with elevated TNF α who volunteered in 3 major hospitals (n = 32; aged 6 -67 years; males – 12; females - 20) in Saki-West local government area of Oyo state – Nigeria.

antibody sandwich ELISA technique where monoclonal antibodies unique to HBsAg, are pre-coated on polystyrene microwell strips. The plasma sample was added together with a second After incubation and washing, to eliminate unwanted serum proteins and unbound HRP-conjugate, chromogen solutions containing tetramethyl-benzidine (TMB) and urea peroxide were added to the wells. The colorless chromogens were hydrolyzed by the bound HRP-conjugate to a blue-colored product. Sulfuric acid was added to stop the reaction and the blue color then turns yellow. This color intensity is directly proportional to the amount of antigen in the samples. If the blue colour remains colorless it indicates HBsAg negative.

Demonstration of Acid Fast Bacilli in sputum

Ziehl-Neelsen (Zn) staining technique was used to demonstrate Acid Fast Bacilli (*Mycobacterium sp*) as Described by Cheesbrough¹⁴.

Identification of Plasmodium species Giemsa staining-thick blood film technique

Plasmodium species were determined by Giemsa staining-thick blood film technique as described by Cheesbrough¹⁴.

Ethical Consideration

Ethical approval for this work was obtained from ethical and research committee of Baptist Medical center Saki-Nigeria before the commencement of this work. Informed consent was also obtained from each of the patients.

Methods of Data Analysis

Data were analysed for mean, percentage and frequency using Statistical Package for Social Sciences (IBM SPSS, version 18).

RESULTS

The overall frequency of the infectious agents was more in herbal homes patients (58.5%(13)) than 37.5%(12) obtained in hospital patients.

The viral immunochemical frequency of anti-HCV, HBsAg and HIV1-p24 antigen including pattern of other infectious agents in herbal homes patients with elevated TNFα (≥ 5.0 pg/ml) include 4.3 %(1)anti-HCV; 17.4% (4) HBsAg; 4.3 %(1) HIV1-p24 antigen; 17.4% (4) *Plasmodium spp.*; 8.7 %(2)Acid Fast Bacilli and 4.3%(1) HBsAg + *Plasmodium spp.*, in patients of herbal homes and 6.3 %(2)anti-HCV; 9.4% (3)HBsAg; 3.1 %(1) HIV1-p24 antigen; 15.6% (6) *Plasmodium spp.*;; 0%(0) Acid Fast Bacilli and 3.1%(1) HBsAg + *Plasmodium spp.*, in patients of the three major hospitals (Table 1).

The frequency of those with 5.0 – 6.0 pg/ml TNFα (65.2% (15)) was more than those whose TNFα was between 6.1 – 6.8 pg/ml (34.8% (8)) in the results obtained in herbal home patients while the frequency of those with 5.0 – 6.0 pg/ml TNFα (40.6%(13)) was lower than those whose TNFα was between 6.1 – 6.8 pg/ml (59.4% (19)) in the results obtained in hospital patients (Table 1).

The pattern of the infectious agents was more in hospital patients with 5.0 – 6.0 pg/ml TNFα than those with 6.1 – 6.8 pg/ml TNFα while the pattern of the infectious agents was more in hospital patients with 6.1 – 6.8 pg/ml TNFα than those with 5.0 – 6.0 pg/ml TNFα (Table 1).

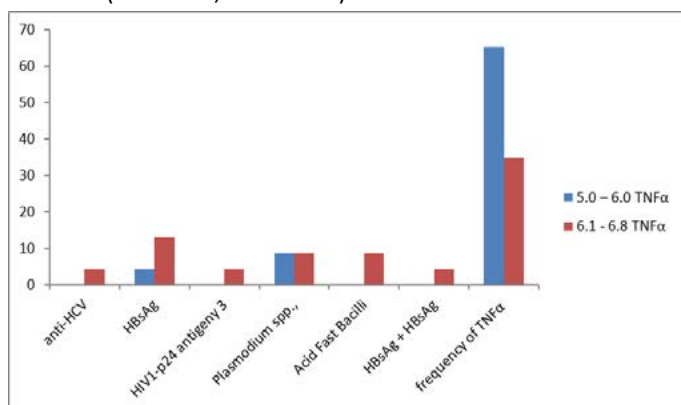


Fig. 1. Frequency of anti-HCV, HBsAg, HIV1-p24 antigen, Acid Fast Bacilli and *Plasmodium spp.*, in herbal home patients

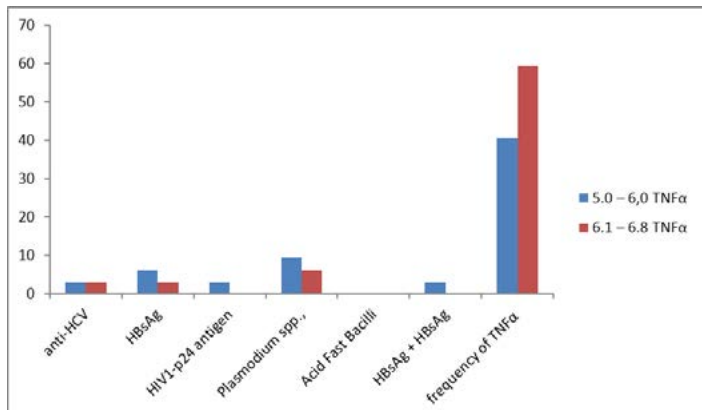


Fig. 2. Frequency of anti-HCV, HBsAg, HIV1-p24 antigen, Acid Fast Bacilli and *Plasmodium spp.*, in hospital patients

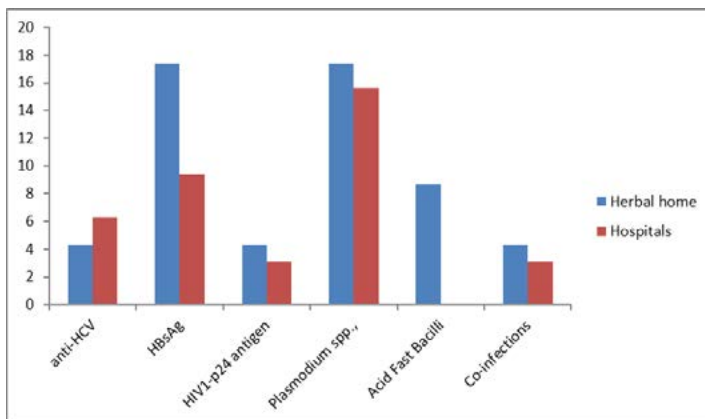


Fig. 3. Comparative analysis of anti-HCV, HBsAg, HIV1-p24 antigen, Acid Fast Bacilli and *Plasmodium spp.*, in herbal home and hospital patients

DISCUSSION

The overall frequency of the infectious agents was more in herbal homes patients (58.5%(13)) than 37.5%(12) obtained in hospital patients.

The viral immunochemical frequency of anti-HCV, HBsAg and HIV1-p24 antigen including pattern of other infectious agents in herbal homes patients with elevated TNFα (≥ 5.0 pg/ml) include 4.3 % (1) anti-HCV; 17.4% (4) HBsAg; 4.3 % (1) HIV1-p24 antigen; 17.4% (4) *Plasmodium spp.*; 8.7 % (2) Acid Fast Bacilli and 4.3 % (1) HBsAg + *Plasmodium spp.*, in patients of herbal homes and 6.3 % (2) anti-HCV; 9.4% (3) HBsAg; 3.1% (1) HIV1-p24 antigen; 15.6% (6) *Plasmodium spp.*; 0% (0) Acid Fast Bacilli and 3.1% (1) HBsAg + *Plasmodium spp.*, in patients of the three major hospitals.

The presence of infectious agents in patients with elevated TNFα (≥5.0 pg/ml)

could be attribute to the fact that TNFα is a proinflammatory cytokine. The release is triggered by the presence of infectious agents to initiate process of inflammatory response and inhibit viral replication. It is also involved in acute phase reaction which can be caused by pathogenic agents.

The frequency of those with 5.0 – 6.0 pg/ml TNFα (65.2% (15)) was more than those whose TNFα was between 6.1 – 6.8 pg/ml (34.8% (8)) in the results obtained in herbal home patients while the frequency of those with 5.0 – 6,0 pg/ml TNFα (40.6%(13)) was lower than those whose TNFα was between 6.1 – 6.8 pg/ml (59.4% (19)) in the results obtained in hospital patients.

In addition the pattern of the infectious agents was more in hospital patients with 5.0 – 6,0 pg/ml TNFα than those with 6.1 – 6,8 pg/ml TNFα while the pattern of the infectious agents was more in hospital patients with 6.1 – 6,8 pg/ml

ml TNF α than those with 5.0 – 6,0 pg/ml TNF α .

The explanation to these include the fact that the patients of herbal homes are regular set of individuals who have been accessing herbal treatment for sometimes while those recruited in the hospitals have never received any herbal treatment. This might be responsible for the differences in the frequency as un-hygienic and unethical practices by some herbalists could bring about cross infection and contaminations during product preparation and administration^{8,9}.

This could be due to the following reasons that drugs administered in hospitals apart from infectious agents can trigger inflammatory response leading to increase in plasma TNF α while most herbal preparations contain anti-inflammatory and antioxidative agents^{1,2} which may also account for the above results.

The findings of this work is consistent with the report of Yusa¹⁵ that IL-4, IL-8, IL-10, IL-12 and TNF- α in addition to WBC counts and CRP levels could be a possible biomarkers of infections.

CONCLUSION

The frequency of viral immunochemical biomarkers, Acid Fast Bacilli and *Plasmodium spp.*, was more in herbal home patients than the patients recruited from the hospital which varies with the TNF α range.

ACKNOWLEDGMENT

None

CONFLICT OF INTERESTS

The authors declare no conflict of interest.

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