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Pilot study to compare the use of the national program drugs ALONE versus their combination with *Artemisia Afra* infusions for the treatment of pulmonary tuberculosis

Abstract

Introduction: Tuberculosis is one of the leading infectious causes of death worldwide. The WHO estimates that 1.7 billion people close to one quarter of the humanity are infected with Mycobacterium Tuberculosis the bacteria that causes TB. Last year, 10.6 million fell ill from TB and 1.6 million died.[1] Moreover, multi resistance to the current anti tuberculosis drugs is growing thus causing a serious challenge in controlling the spread of the disease worldwide. Fortunately, as we demonstrated on previous studies that *Artemisia Afra* infusions given with the WHO approved drugs can shorten treatment duration and resistance.[2] The objective of this pilot study is to compare 25 patients who will take WHO approved products: R [Rifampicin]; H [Isoniazid]; Z [Pyrazinamide]; E [Ethambutol] ALONE to 25 patients who will take the combination of WHO drugs along with *Artemisia Afra* infusions.

Methods: This randomized, controlled trial involved 50 patients with Pulmonary Tuberculosis at the Ijenda District Hospital in Bujumbura rural Province, Burundi in July and August 2023.

Patients were randomized to receive both treatments and were randomly assigned to 2 groups:

A. **Group A:** 25 patients received the WHO drugs [RHZE] ALONE at the recommended dose. [Control group]

B. **Group B:** 25 patients received the combination treatment RHZE [at the recommended dose] +

Artemisia Afra infusion at 330 ml three times a day. [Exploratory group]

The patients of both groups were hospitalized and fed with a protein rich meal and nurses made sure that medications were taken regularly according to DOT [Directly Observed Technique].

Results: All the patients who were on the combination therapy recovered in less than a month whereas the patients who took the WHO treatment ALONE were still sick even though some symptoms were slightly reduced as you will see in the tables below.

Conclusion: The combination therapy [*Artemisia Afra* infusions+ WHO protocol] has a lot of potential in curing tuberculosis but more studies on a larger cohort [300 patients] will be carried out and there will also be a third leg with multi resistant cases that failed first line treatment with many months of sickness.

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Pascal Gisenya,[1] Patrick E Ogwang,[2] Elkan Katotola,[2] Adele Ntezahorigwa,[2] Claudette Ndayininahaze[3]

[1]Heal Africa Hospital 111 Lyn Lusi, Goma, Democratic Republic of Congo
[2]Mbarara University of Sciences and Technology, Uganda
[3]Ijenda Hospital, Burundi

Correspondence: Pascal Gisenya, Heal Africa Hospital 111 Lyn Lusi, Goma, North Kivu, Democratic Republic of Congo, Email pbgisenya@gmail.com

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Introduction

Tuberculosis is an infectious disease caused by Mycobacterium Tuberculosis and has the following symptoms: cough, fever, thoracic pain, hemoptysis, anorexia, dyspnea, weight loss, night sweats. To date the WHO treatment consists of the combination of the following molecules: Rifampicin; Isoniazid; Pyrazinamide and Ethambutol. Last year we demonstrated that *Artemisia Afra* infusions given with the above-mentioned products can speed up completely resolution of all the symptoms as well as provide a negative sputum test and a negative X ray chest radio.[2] The objective of the present study is to prove that the combination therapy [exploratory] is far better than the traditional WHO approved products given ALONE [control].

Materials and methods

Study design

This randomized control trial included tuberculosis patients between the age of 12 and 70 at the Ijenda District Hospital in Bujumbura rural Province, Burundi between July and August 2023. The following symptoms: fever, cough, weight loss were monitored by nurses during the time where the patients were hospitalized and fed with a rich protein meal to rule out malnutrition.

The ***Artemisia Afra*** infusion was made at the hospital and medications were dispensed by qualified personal to make sure patients took their medications through the WHO recommended DOT directly observed technique. After the patients were discharged a nurse visited them on the subsequent days at their homes to check on their general health as well as weigh them with a commercial scale.

WHO regimen[3]

Isoniazid	Adults (maximum)	5 mg/kg (300 mg)	15 mg/kg (900 mg)	15 mg/kg (900 mg)	15 mg/kg (900 mg)
	Children (maximum)	10–20 mg/kg (300 mg)	N/A	20–40 mg/kg (900 mg)	N/A
Rifampin	Adults (maximum)	10 mg/kg (600 mg)	N/A	10 mg/kg (600 mg)	10 mg/kg (600 mg)
	Children (maximum)	10–20 mg/kg (600 mg)	N/A	10–20 mg/kg (600 mg)	N/A
Rifabutin	Adults (maximum)	5 mg/kg (300 mg)	N/A	5 mg/kg (300 mg)	5 mg/kg (300 mg)
	Children	10–20 mg/kg (300 mg)	N/A	10–20 mg/kg (300 mg)	10–20 mg/kg (300 mg)
Rifapentine‡	Adults	N/A	10 mg/kg (600 mg)	N/A	N/A
	Children	N/A	N/A	N/A	N/A
Pyrazinamide	Adults (whole tablets):				
	40–55 kg	1 g	N/A	2 g	1.5 g
	56–75 kg	1.5 g	N/A	3 g	2.5 g
	≥ 76 kg§	2 g	N/A	4 g	3 g
	Children (maximum)	15–30 mg/kg (2 g)	N/A	50 mg/kg (2 g)	N/A
Ethambutol	Adults (whole tablets):				
	40–55 kg	800 mg	N/A	2000 mg	1200 mg
	56–75 kg	1200 mg	N/A	2800 mg	2000 mg
	≥ 76 kg§	1600 mg	N/A	4000 mg	2400 mg
	Children (maximum)	15–20 mg/kg (1 g)	N/A		

Anti-tuberculosis medications side effects[4]

It is Important to mention that the patients in both arms took the WHO recommended pills and developed some of the following side effects mentioned in the table below but those of the exploratory group coped better than those in the control group.

Isoniazid

- Feeling irritable, tiredness, lack of concentration, and a worsening of acne.
- Nausea, vomiting, stomach pain
- Tingling of the fingers and toes.
- Skin itchiness and rashes.

Rifampicin

- The main side effects are stomach upsets and discomfort, nausea and loss of appetite. Vomiting and diarrhea may occur although this is rare.
- Inflammation of the liver worsened by alcohol use.

Pyrazinamide

- loss of appetite, nausea and flushing.
- Joints pain in their joints. This is usually mild and painkillers such as aspirin or paracetamol will ease thepain.
- nausea (feeling sick), vomiting, stomach pain
- Skin reactions such as itchiness, rashes and photosensitivity (becoming sunburned easily)

Ethambutol

- Tablets come in two strengths, 400mg and 100mg. Your doctor will give you your dose according to yourweight.
- Vision change and blurred vision.
- Joints pain, itchiness and rashes.

Even the Global fund recognizes this problem as per the extract below:

From global tuberculosis report 2020

Prior to the COVID-19 pandemic, many countries were making steady progress in tackling tuberculosis (TB), with a 9% reduction in incidence seen between 2015 and 2019 and a 14% drop in deaths in the same period. High-level political commitments at global and national levels were delivering results. However, a new report from WHO shows that access to TB services remains a challenge, and that global targets for prevention and treatment will likely be missed without urgent action and investments. Approximately 1.4 million people died from TB-related illnesses in 2019. Of the estimated 10 million people who developed TB that year, some 3 million were not diagnosed with the disease, or were not officially reported to national authorities. The situation is even more acute for people with drug-resistant TB. About 465 000 people were newly diagnosed with drug-resistant TB in 2019 and, of these, less than 40% were able to access treatment. There has also been limited progress in scaling up access to treatment to prevent TB. "Equitable access to quality and timely diagnosis, prevention, treatment and care remains a challenge," said Dr Tedros Adhanom Ghebreyesus, Director-General of WHO. "Accelerated action is urgently needed worldwide if we are to meet our targets by 2022." About 14 million people were treated for TB in the period 2018-2019, just over one-third of the way towards the 5-year target (2018-2022) of 40 million, according to the report. Some 6.3 million people started TB preventive treatment in 2018-2019, about one-fifth of the way towards the 5-year target of 30 million. Funding is a major issue. In 2020, funding for TB prevention, diagnosis, treatment and care reached US$ 6.5 billion, representing only half of the US$ 13 billion target agreed by world leaders in the UN Political Declaration on TB.

The COVID-19 pandemic and TB

Disruptions in services caused by the COVID-19 pandemic have led to further setbacks. In many countries, human, financial and other resources have been reallocated from TB to the COVID-19 response. Data collection and reporting systems have also been negatively impacted. According to the new report, data collated from over 200 countries has shown significant reductions in TB case notifications, with 25-30% drops reported in 3 high burden countries – India, Indonesia, the Philippines – between January and June 2020 compared to the same 6-month period in 2019. These reductions in case notifications could lead to a dramatic increase in additional TB deaths, according to WHO modelling.[5]

However, in line with WHO guidance, countries have taken measures to mitigate the impact of COVID-19 on essential TB services, including by strengthening infection control. A total of 108

countries – including 21 countries with a high TB burden – have expanded the use of digital technologies to provide remote advice and support. To reduce the need for visits to health facilities, many countries are encouraging home-based treatment, all-oral treatments for people with drug-resistant TB, provision of TB preventive treatment, and ensuring people with TB maintain an adequate supply of drugs. "In the face of the pandemic, countries, civil society and other partners have joined forces to ensure that essential services for both TB and COVID-19 are maintained for those in need," said Dr Tereza Kaseva, Director of WHO's Global TB Programme. "These efforts are vital to strengthen health systems, ensure health for all, and save lives." A recent progress report from the UN Secretary General outlines 10 priority actions for Member States and other stakeholders to close gaps in TB care, financing and research, as well as advance multisectoral action and accountability, including in the context of the COVID-19 pandemic.

Note for the editors

Global targets

In 2014 and 2015, all Member States of WHO and the UN adopted the UN Sustainable Development Goals (SDGs) and WHO's End TB Strategy. The SDGs and End TB Strategy both include targets and milestones for large reductions in TB incidence, TB deaths and costs faced by TB patients and their households. TB is included under Goal 3 Target 3.3 of the SDGs which aims to "end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases" by the year 2030. 8 The WHO End TB Strategy aims for a 90 per cent reduction in TB deaths and an 80 per cent reduction in the TB incidence rate by 2030, compared to the 2015 baseline. Milestones for 2020 include a 20% reduction in the TB incidence rate and a 35% reduction in TB deaths.

Efforts to step up political commitment in the fight against TB intensified in 2017 and 2018 culminating, in September 2018, in the first-ever high-level meeting on TB at the UN General Assembly. The outcome was a political declaration in which commitments to the SDGs and End TB Strategy were reaffirmed. The UN Political Declaration on TB also included 4 new targets for the period 2018-2022:

- *Treat 40 million people for TB disease*
- *Reach at least 30 million people with TB preventive treatment for a latent TB infection*
- *Mobilize at least US$13 billion annually for universal access to TB diagnosis, treatment and care*
- *Mobilize at least US$2 billion annually for TB research*

Progress towards global targets

According to the new report, the WHO European Region is on track to achieve key 2020 targets of the WHO End TB Strategy, with reductions in incidence and deaths of 19% and 31%, respectively, over the last 5-year period. The African Region has also made impressive gains, with corresponding reductions of 16% and 19% in the same timeframe. On a global scale, however, the pace of progress has lagged, and critical 2020 milestones of the End TB Strategy will be missed.

Financing

As in previous years, most available TB funding (85%) in 2020 came from domestic sources, with Brazil, Russian Federation, India, China and South Africa providing 57% of the global total. International donor funding, as reported by national TB programmes (NTPs), increased from US$ 0.9 billion in 2019 to US$ 1.0 billion in 2020. The Global Fund to Fight AIDS, Tuberculosis and Malaria was the single largest source of international TB financing in 2020, while the United States remains the biggest bilateral funder of efforts to end TB.

Research and innovation

Reaching the 2030 global TB targets will require technological breakthroughs by 2025. The world needs affordable and accessible rapid point-of-care tests, as well as new, safer and more effective treatments and vaccines. To meet these challenges, Member States called on WHO in 2018 to develop a Global strategy for TB research and innovation that lays out key steps that governments and non-state actors can undertake. The strategy was adopted by the World Health Assembly in August 2020.

Multisectoral action and accountability

Further progress towards ending TB will depend on action across sectors, underscoring the importance of the implementation of WHO's multisectoral accountability framework on TB. In 2019 and 2020, WHO worked with high TB-burden countries to ensure the inclusion of accountability mechanisms in national budget planning and pursuing assessment during high-level missions and joint TB programme reviews with engagement of civil society representatives.

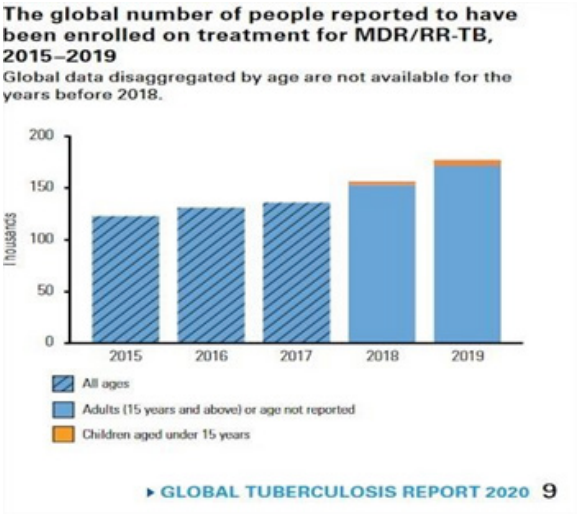
TB facts

Tuberculosis (TB), the world's deadliest infectious killer, is caused by bacteria (Mycobacterium tuberculosis) that most often affect the lungs. It can spread when people who are sick with TB expel bacteria into the air – for example, by coughing. Approximately 90 percent of those who fall sick with TB each year live in 30 countries. Most people who develop the disease are adults, and there are more cases among men than women. TB is preventable and curable. About 85% of people who develop TB disease can be successfully treated with a 6-month drug regimen; treatment has the added benefit of curtailing onward transmission of infection. Since 2000, TB treatment has averted more than 60 million deaths – although with access to universal health coverage still falling short, many millions have also missed out on diagnosis and care. In partnership, we are making progress to end the disease as an epidemic. The number of people treated for TB has grown to over 14 million in 2018 and 2019. People provided with TB preventive treatment has also quadrupled since 2015, from 1 million in 2015 to over 4 million in 2019.

Drug-resistant TB

In most cases, TB is treatable and curable. However, standard TB treatment requires up to six months of drugs that can cause nausea, vomiting and stomach pain. The duration and side effects drive some people to abandon their treatment, which can lead to drug resistance–when TB bacteria is resistant to at least one of the main TB drugs. In 2018, about 500,000 people became ill with drug-resistant TB with only about 56% completing treatment successfully. Drug-resistant TB is part of the growing challenge of antimicrobial-resistant superbugs that do not respond to existing medications, resulting in fewer treatment options and increasing mortality rates for illnesses that would ordinarily be curable – including TB. Multidrug-resistant TB now accounts for one- third of the world's deaths from antimicrobial resistance.

https://www.who.int/publications/i/item/9789240013131



High protein nutrition diet: Milk, Meat, Eggs, Fish

Data analysis

The following tables show the trend of the observed parameters on Day 0, 5, 10, 15, 20, 25 and 30 for both treatments.

I. CONTROL GROUP {WHO DRUGS ALONE]: 25 patients

The following assessment was made:

Day 0 upon admission

- Temperature was 40 degrees Celsius
- Cough was very severe 99.8 %
- The mean weight was 33 Kgs

Day 5

- Temperature was still high 39 degrees Celsius
- Cough was still severe 88.2%
- The mean weight was 36 Kgs

Day 10

- Temperature was still significantly high 38.5 Celsius
- Cough persisted at 87%
- The weight did not change still at 36 Kgs

Day 15

- Temperature slightly changed 38.2 Celsius
- Cough persisted at 82.6%
- The weight was soaring at 36 Kgs

Day 20

- Temperature remained the same 38 Celsius
- Cough persisted at 83.4 %
- The weight was 37 Kgs

Day 25

- Temperature remained at 38 Celsius
- Cough persisted at 80 %
- The weight remained at 37 Kgs

Day 30

- Temperature remained at 38 Celsius
- Cough persisted at 80 %
- The Weight remained at 37 Kgs

Two cases in this group are worth mentioning.

Case N° 1

A 40 years old male patient was admitted at the hospital with high fever [40 degrees Celsius], very severe cough and chest pain. Laboratory analysis shows a granulocyte predominant leukocytosis. A chest X ray showed a pulmonary opacity typical for tuberculosis and the sputum smear was ++After 24 hours on oxygen therapy and Paracetamol injection, the medical team decided to start the TB protocol and he was enrolled in the control group with WHO pills only along with the high protein meals as per protocol. After 10 days of treatment, the fever remained high 39 degrees, the cough was slightly reduced and the dyspnea as well as he was no longer on oxygen therapy. Astonishingly after 25 days of treatment he could not tolerate the RHZE pills anymore as he had stomach pain and nausea. He started skipping to take the pills as they were making him sick and was therefore removed from the study as per protocol. He noticed that some of his roommates were getting better and wondered what has happened to him. At the end he was given ***Artemisia Afra*** infusions for humanitarian reasons and was able to continue taking his RHZE along. He has now fully recovered and his X ray is completely clear as per the pictures below.

Figure 1 Patient no 003 who abandoned treatment because of WHO pills side effects got better after treatment and resumed his job as a construction worker (in red jacket and boots).

Case N°2

Another case is for a 36 years old lady who was admitted on July 25 at the hospital with the following symptoms: chest pain, high fever [39 degrees Celsius], non-stop night cough. The laboratory blood tests showed a leukocytosis and the x ray was positive. The sputum smear was negative. The medical team suspected pulmonary tuberculosis and randomly assigned her to the control group. She was put on RHZE and fed with the high protein meals as per protocol. Unfortunately, after 30 days of treatment her condition remained practically the same with the following parameters: very slight weight gain [from 40 Kgs to 43 in 30 days], moderate fever [from 39 to 38 degrees Celsius].

II. EXPLORATORY GROUP [Artemisia Afra infusions + WHO pills]: 25 patients

The following assessment was made:

Day 0 upon admission

- Temperature was 40 degrees Celsius
- Cough was very severe 100 % for all patients
- The mean weight was 35 Kgs

Day 5

- Temperature dropped to 37 degrees Celsius
- Cough was persistent for 75% of the patients
- The mean weight was increased by an average of 2 Kgs gain per patient 37 Kgs

Day 10

- Temperature remained normal 37 degrees Celsius
- Cough was present for 50% of the patients
- The weight continued to increase to an average of 40 Kgs

Day 15

- Temperature remained normal 37 degrees Celsius
- Cough was persistent for 25% of the patients and many of them wanted to go back home to dig in their fields
- The weight was soaring at 42 Kgs

Day 20

- Temperature remained the same 37 Celsius
- Cough was completely cleared for all the patients
- The average weight was 44 Kgs

Day 25

- Temperature remained the same 37 Celsius
- Cough was completely cleared for all the patients
- The average weight was 46 Kgs

Day 30

- Temperature remained the same 37 Celsius
- Cough was completely cleared for all the patients
- The weight was 48 Kgs

2 cases are worth mentioning in this group.

Case no 1

A 16 old female patient accepted in the emergency room on July 03 with the following symptoms: persistent cough, dyspnea, high fever [41 degrees Celsius], nocturnal sweats and chest pain. On physical examination, she has crackling rales and an oxygen saturation of 90%. Superinfected pulmonary tuberculosis is suspected. Laboratory analysis shows a granulocyte predominant leukocytosis. A chest X ray is taken and it shows a pulmonary opacity typical for tuberculosis even though the sputum smear is negative.

The medical team decides to put her on ampicillin and hydrocortisone injections but there is no improvement. After 24 hours, the medical team decides to start the TB protocol and she is enrolled in the exploratory group with WHO pills and ***Artemisia Afra*** infusions along with the high protein meals as per protocol. Astonishingly after 48 hours of treatment there is no more dyspnea and no need for oxygen therapy. Five days after treatment the fever is normal [37 degrees Celsius] and there is no coughing either. The patient is released to go home on July 23 [See pictures below before treatment and after recovery].

Before treatment **After treatment**

Figure 2 16 years old girl who got the combination treatment (WHO pills with *Artemisia Afra* infusion) before treatment (left) and after treatment (right).

Case no 2

A 13 years old female patient is admitted at the hospital on July 09 with the following symptoms: cough, high fever [40 degrees Celsius], chest pain, swelling on both legs and at the right hand. A physical examination is showing a significant limb swelling and crackling rales are noticed on auscultation. The medical team is suspecting a bacterial pneumonia. The laboratory analysis is showing a granulocyte predominant leukocytosis. A chest X ray is showing a pulmonary opacity and the sputum smear for mycobacterium tuberculosis is +++.

The medical team decides to put her on Penicillin G with Paracetamol injection. Three days later her situation is not getting better and the medical team decides to start oxygen therapy because her dyspnea is getting worse. Pulmonary tuberculosis disseminated to the limbs is suspected and she is randomly enrolled in the exploratory group. The medical team decides to put her on RHZE pills and Artemisia Afra infusions along with high protein nutrition as per protocol. The nurses continue to take care of her swollen limbs by massage therapy. After 10 days of treatment the fever is completely gone and there is no more chest pain or coughing. She is released from hospital on August 08 after a negative chest x ray and a negative sputum smear [See pictures below before and after treatment].

Before treatment **After treatment**

Figure 3 13 years old girl who was on oxygen Day 0 (left) and got better (right).

Citation: Gisenya P, Ogwang PE, Katotola E, et al. Pilot study to compare the use of the national program drugs ALONE versus their combination with *Artemisia Afra* infusions for the treatment of pulmonary tuberculosis. *Pharm Pharmacol Int J.* 2023;11(4):118–131. DOI: 10.15406/ppij.2023.11.00410

Cough in % of severity

Days	WHO ALONE	WHO+ARTEMISIA
0	100	100
5	88.2	75
10	87	50
15	82.6	25
20	83.4	0
25	80	0
30	80	0

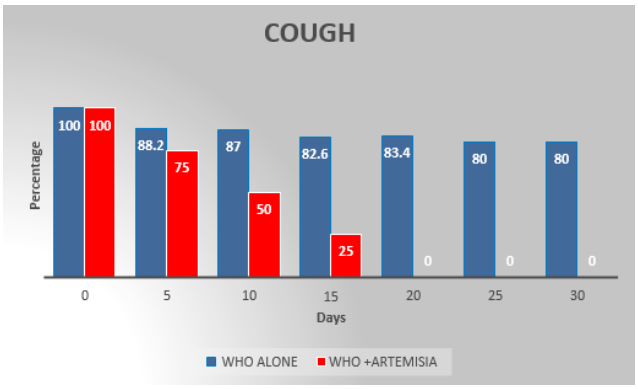


Figure 4 Comparison of cough progress for the control (blue) versus the exploratory (red).

Temperature in Celsius

Days	WHO ALONE	WHO+ ARTEMISIA
0	40	40
5	39	37
10	38.5	37
15	38.2	37
20	38	37
25	38	37
30	38	37

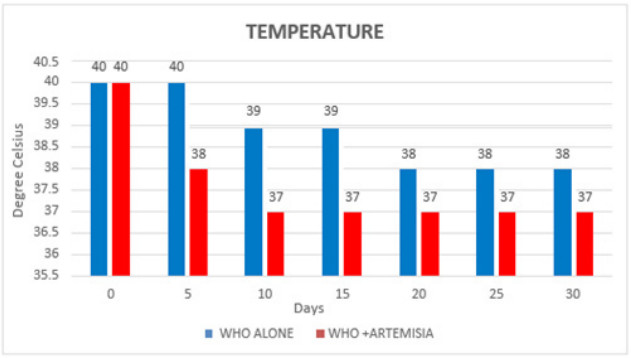


Figure 5 Comparison of the temperature progress for the control (blue) versus the exploratory (red).

Weight in kilograms

Days	WHO ALONE	WHO+ ARTEMISIA
0	33	35
5	36	37
10	36	40
15	36	42
20	37	44
25	37	46
30	37	48

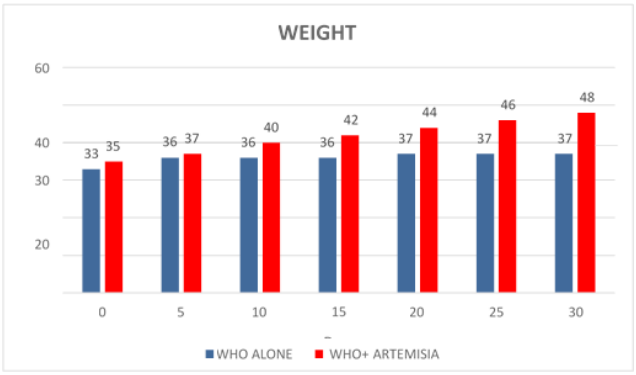


Figure 6 Comparison of the weight progress for the control (blue) versus the exploratory (red).

Conclusion

The administration of Artemisia Afra infusions in combination with conventional WHO treatment gave an astonishingly faster and higher efficacy relief of symptoms than conventional treatment alone, which may take up to 6 months or more. It is well known from scientific literature that WHO pills have significant side effects[7] and we noticed that 10 patients out of the 25 had a hard time continuing taking the pills due to unpleasant side effects such as nausea, throwing up and general malaise whereas there were no side effects for those who were in the exploratory group.[8]

Furthermore, according to a Californian study the cost of hospitalization and medication was USD 34600 for a regular TB case and for a multiresitant case the cost was USD 110900 in 2015 whereas the treatment with the combination of WHO pills plus Artemisia infusion will barely cost 1000 USD.[9] It is the author's opinion that these remarkable results should constitute a wakeup call to different key opinion leaders in order to address this burden to the society in terms of cost, time wasted in hospital and suffering to the humanity with the unnecessary prolonged hospitalization [9 months versus 30 days].[10]

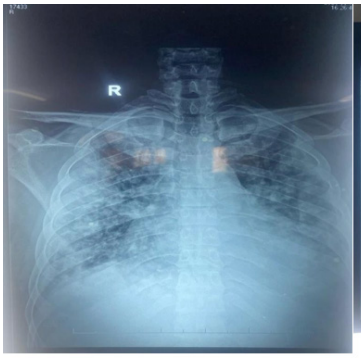
It is important to note that at the end of the study:

- X ray photographs were taken and all the patients in the control group showed presence of tuberculosis lesions in their lungs whereas the X ray for the exploratory were negative [see picture below].
- Sputum smears were examined on a microscope and the control showed 100 % of mycobacterium tuberculosis whereas there was none in the exploratory arm.

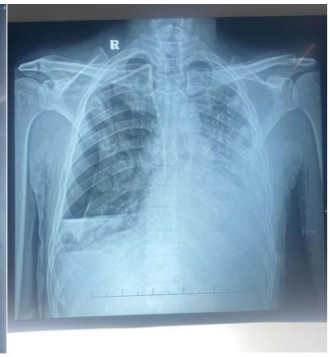
Citation: Gisenya P, Ogwang PE, Katotola E, et al. Pilot study to compare the use of the national program drugs ALONE versus their combination with *Artemisia Afra* infusions for the treatment of pulmonary tuberculosis. *Pharm Pharmacol Int J.* 2023;11(4):118–131. DOI: 10.15406/ppij.2023.11.00410

Thorax radiography protocol

IDENTITY: Patient number 32, Male, 31 years old.



Patient N° 32 Before Treatment



Patient N° 32 After Treatment

A. Before treatment:

Right lung:

Presence of reticular and nodular opacities disseminated throughout the pulmonary field.

Left lung:

- Presence of reticular and nodular opacities scattered throughout the pulmonary field. There was slight cardiomegaly, the other thoracic structures appeared normal.

Conclusion: probable severe tuberculous pneumonia, fear of tuberculosis.

B. After treatment:

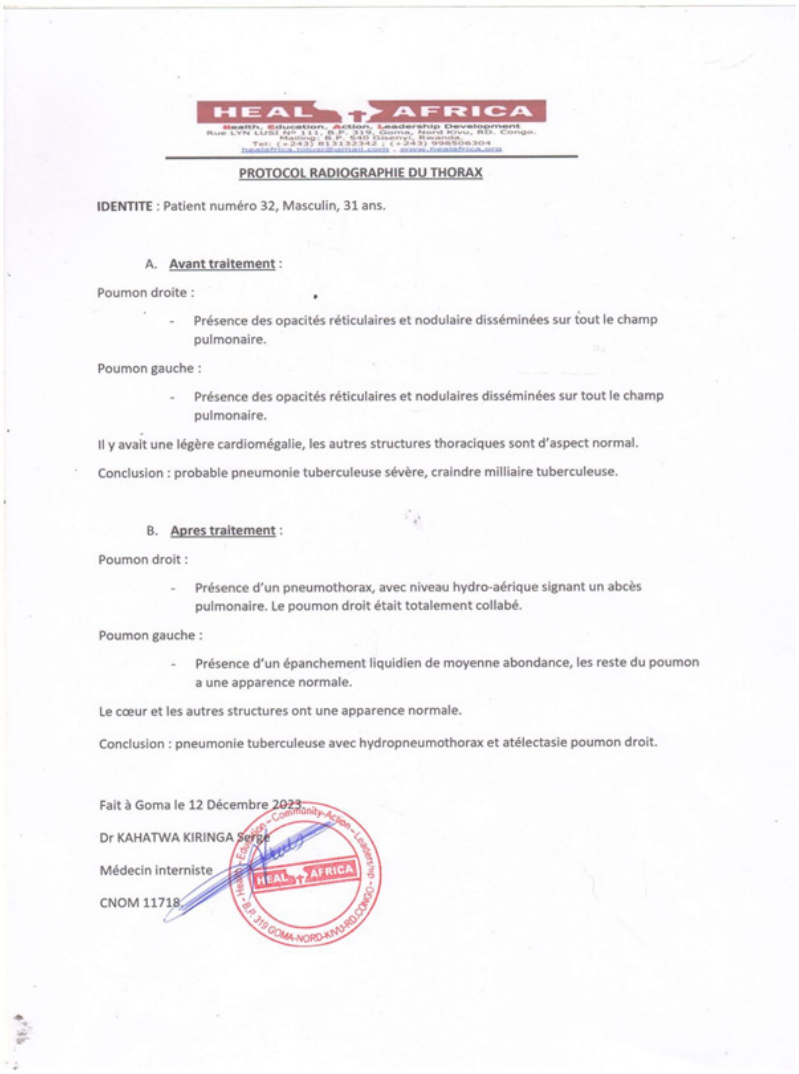
Right lung:

- Presence of a pneumothorax, with fluid and air level indicating a pulmonary abscess. The right lung was completely collapsed.

Left lung:

- Presence of a fluid effusion of moderate abundance, the rest of the lung has a normal appearance. The heart and other structures appear normal.

Conclusion: tuberculous pneumonia with hydropneumothorax and right lung atelectasis.



HEAL AFRICA

Health, Education, Action, Leadership Development

PROTOCOL RADIOGRAPHIE DU THORAX

IDENTITE : Patient numéro 32, Masculin, 31 ans.

A. Avant traitement :

Poumon droite :

- Présence des opacités réticulaires et nodulaire disséminées sur tout le champ pulmonaire.

Poumon gauche :

- Présence des opacités réticulaires et nodulaires disséminées sur tout le champ pulmonaire.

Il y avait une légère cardiomégalie, les autres structures thoraciques sont d'aspect normal.

Conclusion : probable pneumonie tuberculeuse sévère, craindre milliaire tuberculeuse.

B. Apres traitement :

Poumon droit :

- Présence d'un pneumothorax, avec niveau hydro-aérique signant un abcès pulmonaire. Le poumon droit était totalement collabé.

Poumon gauche :

- Présence d'un épanchement liquidien de moyenne abondance, les reste du poumon a une apparence normale.

Le cœur et les autres structures ont une apparence normale.

Conclusion : pneumonie tuberculeuse avec hydropneumothorax et atélectasie poumon droit.

Fait à Goma le 12 Décembre 2023

Dr KAHATWA KIRINGA Serge

Médecin interniste

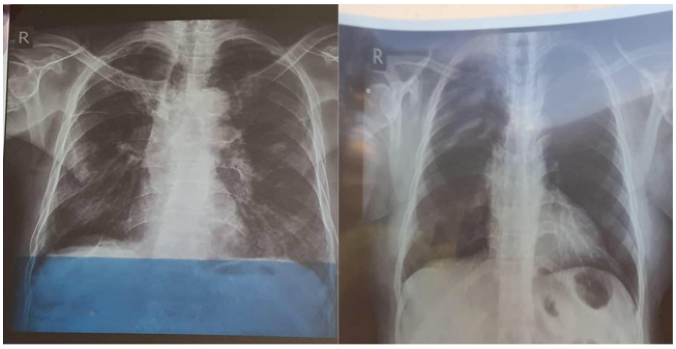
CNOM 11718

Original French version of the report above. [N°32]

Citation: Gisenya P, Ogwang PE, Katotola E, et al. Pilot study to compare the use of the national program drugs ALONE versus their combination with *Artemisia Afra* infusions for the treatment of pulmonary tuberculosis. *Pharm Pharmacol Int J.* 2023;11(4):118–131. DOI: 10.15406/ppij.2023.11.00410

Thorax radiography protocol

IDENTITY: patient number 28, Male, adult



Patient N° 28 Before Treatment *Patient N° 28 After Treatment*

A. Before treatment:

Right lung:

- Presence of reticular opacities
- Presence of hilar lymphadenopathy
- Scissuritis in the upper lung field. Left lung:
- Presence of reticular opacities in the lower field
- Presence of hilar lymphadenopathy.

Conclusion: probable tuberculous pneumonia with signs of pulmonary fibrosis.

B. After treatment:

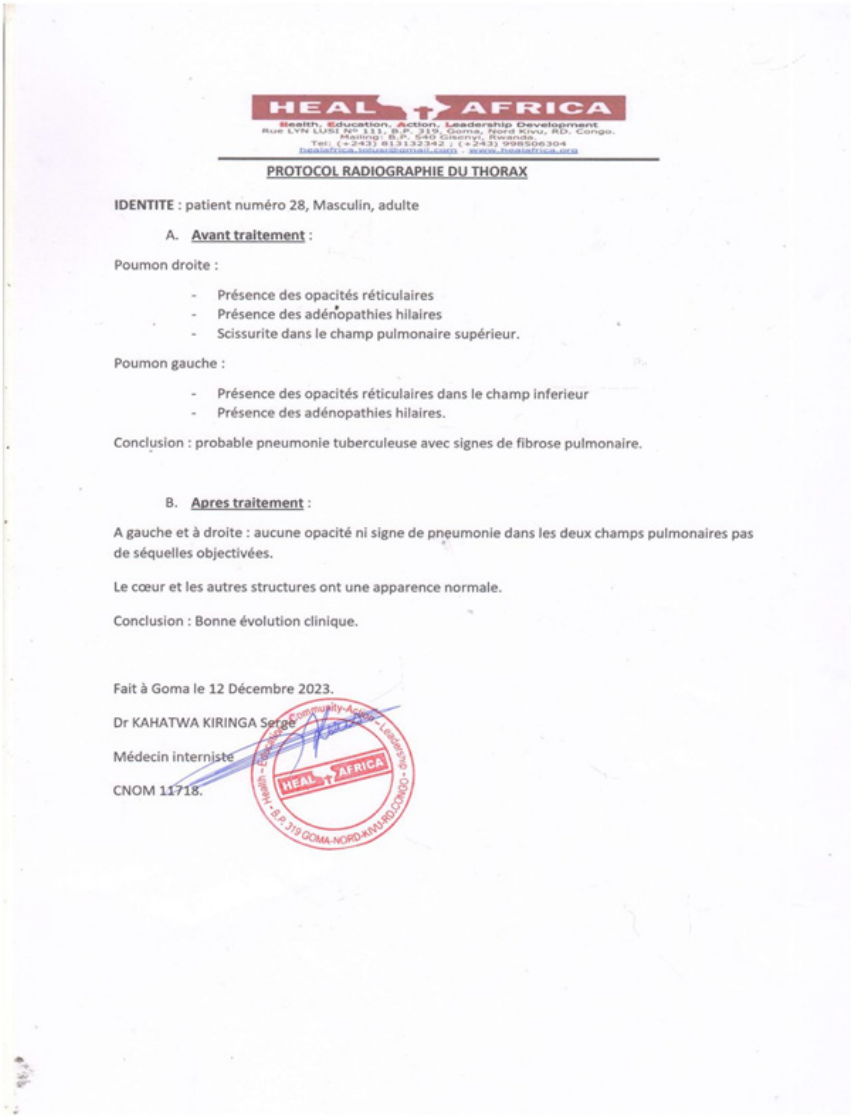
On the left and right: no opacity or sign of pneumonia in the two pulmonary fields, no visible after- effects.

The heart and other structures appear normal.

Conclusion: Good clinical remission.

Done in Goma on December 12, 2023.

Dr KAHATWA KIRINGA, Specialist in Internal Medicine.



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Health, Education, Action, Leadership Development

Rue LYN LUSI N° 111, B.P. 319, Goma, Nord Kivu, RD, Congo.

Mailing: B.P. 540 Gisenyi, Rwanda.

Tel: (+243) 813132342 / (+243) 998506304

healafrica_toumainomail.com - www.healafrica.org

PROTOCOL RADIOGRAPHIE DU THORAX

IDENTITE : patient numéro 28, Masculin, adulte

A. Avant traitement :

Poumon droite :

- Présence des opacités réticulaires
- Présence des adénopathies hilaires
- Scissurite dans le champ pulmonaire supérieur.

Poumon gauche :

- Présence des opacités réticulaires dans le champ inferieur
- Présence des adénopathies hilaires.

Conclusion : probable pneumonie tuberculeuse avec signes de fibrose pulmonaire.

B. Apres traitement :

A gauche et à droite : aucune opacité ni signe de pneumonie dans les deux champs pulmonaires pas de séquelles objectivées.

Le cœur et les autres structures ont une apparence normale.

Conclusion : Bonne évolution clinique.

Fait à Goma le 12 Décembre 2023.

Dr KAHATWA KIRINGA Serge

Médecin interniste

CNOM 11718.

Original French version of the report above. [N°28]

Citation: Gisenya P, Ogwang PE, Katotola E, et al. Pilot study to compare the use of the national program drugs ALONE versus their combination with *Artemisia Afra* infusions for the treatment of pulmonary tuberculosis. *Pharm Pharmacol Int J.* 2023;11(4):118–131. DOI: 10.15406/ppij.2023.11.00410

The authors declare that there is no conflict of interest in this study and confirm that recommend further studies on a larger cohort [300 people] to confirm what was observed in vitro by our colleagues Prof. Pamela Weathers [3] and in vivo by Dr Jerome Munyangi on the Buruli Ulcer [4] on addressing Mycobacterium Species.

Finally, it is important to note that for humanitarian reasons the 23 control group patients who were still sick at the end of the study were given Artemisia Afra infusions and are now completely healed after 3 weeks of treatment.

The authors wish to thank people of good will who accompanied them financially for the completion of this humble work and encourage others to pursue this golden opportunity to address multi resistance of the mycobacterium tuberculosis [5] thus reducing cost, suffering and burden to society.

Additional information of detailed results is given in the tables below:

I. Control group: 25 patients

Table 1 Description of main clinical symptoms for the control group on Day 0

No	Age	Sex	Location	Fever	Cough	Weight
N0001	16	F	IJENDA	40	100	35
N0002	14	F	IJENDA	40	100	37
N0003	30	M	RUKOKO	41	95	34
N0004	32	F	IJENDA	40	100	35
N0005	56	F	RUKOKO	40	100	36
N0006	60	M	IJENDA	40	100	33
N0007	45	F	IJENDA	40	100	35
N0008	48	F	IJENDA	40	100	34
N0009	32	M	IJENDA	40	100	36
N0010	30	F	RUKOKO	40	100	32
N0011	28	M	IJENDA	40	100	35
N0012	46	F	IJENDA	40	100	35
N0013	48	M	RUKOKO	40	100	36
N0014	33	F	RUKOKO	40	100	33
N0015	42	F	IJENDA	40	100	32
N0016	32	M	IJENDA	40	100	33
N0017	31	M	IJENDA	40	100	31
N0018	29	M	IJENDA	39	100	34
N0019	22	M	IJENDA	40	100	36
N0020	34	F	IJENDA	40	100	35
N0021	36	F	RUKOKO	41	100	35
N0022	33	F	RUKOKO	41	100	36
N0023	23	M	RUKOKO	40	100	37
N0024	21	M	RUKOKO	40	100	38
N0025	21	F	IJENDA	40	100	33

Day 0: Mean temperature-40, Cough-99.8 %, Weight-33 Kgs

Table 2 Description of main clinical symptoms for the control group on day 5

No	Age	Sex	Location	Fever	Cough	Weight
N0001	16	F	IJENDA	39	90	36
N0002	14	F	IJENDA	40	90	38
N0003	30	M	RUKOKO	39	90	35
N0004	32	F	IJENDA	39	90	36
N0005	56	F	RUKOKO	39	90	36
N0006	60	M	IJENDA	40	90	36
N0007	45	F	IJENDA	40	90	36
N0008	48	F	IJENDA	39	90	36
N0009	32	M	IJENDA	39	85	36

Table 2 Continued...

No	Age	Sex	Location	Fever	Cough	Weight
N0010	30	F	RUKOKO	38	80	36
N0011	28	M	IJENDA	38	100	36
N0012	46	F	IJENDA	38	90	36
N0013	48	M	RUKOKO	40	90	36
N0014	33	F	RUKOKO	39	90	36
N0015	42	F	IJENDA	38	80	35
N0016	32	M	IJENDA	40	90	36
N0017	31	M	IJENDA	40	90	36
N0018	29	M	IJENDA	39	90	36
N0019	22	M	IJENDA	38	80	36
N0020	34	F	IJENDA	38	90	36
N0021	36	F	RUKOKO	40	80	36
N0022	33	F	RUKOKO	40	80	36
N0023	23	M	RUKOKO	40	90	37
N0024	21	M	RUKOKO	38	90	38
N0025	21	F	IJENDA	38	90	36

Day 5: Mean temperature-39, cough- 88.2 %, weight 36 Kgs.

Table 3 Description of main clinical symptoms for the control group on day 10

No	Age	Sex	Location	Fever	Cough	Weight
N0001	16	F	IJENDA	38	90	36
N0002	14	F	IJENDA	38	90	38
N0003	30	M	RUKOKO	38	90	35
N0004	32	F	IJENDA	38	90	36
N0005	56	F	RUKOKO	38	90	36
N0006	60	M	IJENDA	39	90	36
N0007	45	F	IJENDA	39	90	36
N0008	48	F	IJENDA	39	85	36
N0009	32	M	IJENDA	38	85	36
N0010	30	F	RUKOKO	39	85	35
N0011	28	M	IJENDA	39	85	36
N0012	46	F	IJENDA	39	85	37
N0013	48	M	RUKOKO	39	85	38
N0014	33	F	RUKOKO	38	85	38
N0015	42	F	IJENDA	38	90	36
N0016	32	M	IJENDA	39	85	36
N0017	31	M	IJENDA	39	80	36
N0018	29	M	IJENDA	38	90	36
N0019	22	M	IJENDA	39	85	36
N0020	34	F	IJENDA	39	90	36
N0021	36	F	RUKOKO	38	80	36
N0022	33	F	RUKOKO	38	80	36
N0023	23	M	RUKOKO	38	90	36
N0024	21	M	RUKOKO	38	90	36
N0025	21	F	IJENDA	38	90	36

Day 10: Mean temperature-38.5 Celsius, cough-87 %, weight-36 kgs

Table 4 Description of main clinical symptoms for the control group on day 15

No	Age	Sex	Location	Fever	Cough	Weight
N0001	16	F	IJENDA	38	85	36
N0002	14	F	IJENDA	38	85	36
N0003	30	M	RUKOKO	38	85	36
N0004	32	F	IJENDA	38	85	36
N0005	56	F	RUKOKO	38	85	36
N0006	60	M	IJENDA	39	85	37
N0007	45	F	IJENDA	39	85	35
N0008	48	F	IJENDA	39	80	36
N0009	32	M	IJENDA	38	80	36
N0010	30	F	RUKOKO	39	80	36
N0011	28	M	IJENDA	39	80	36
N0012	46	F	IJENDA	39	80	36
N0013	48	M	RUKOKO	38	80	36
N0014	33	F	RUKOKO	38	80	36
N0015	42	F	IJENDA	39	80	36
N0016	32	M	IJENDA	38	85	36
N0017	31	M	IJENDA	38	85	36
N0018	29	M	IJENDA	38	80	36
N0019	22	M	IJENDA	38	80	36
N0020	34	F	IJENDA	38	80	36
N0021	36	F	RUKOKO	38	85	36
N0022	33	F	RUKOKO	38	85	36
N0023	23	M	RUKOKO	38	85	36
N0024	21	M	RUKOKO	38	85	36
N0025	21	F	IJENDA	38	80	36

Day 15: Mean temperature-38.2, cough-82.6 %, weight-36 kgs.

Table 5 Description of the clinical symptoms for the control group on day 20

No	Age	Sex	Location	Fever	Cough	Weight
N0001	16	F	IJENDA	38	85	37
N0002	14	F	IJENDA	38	85	37
N0003	30	M	RUKOKO	38	85	37
N0004	32	F	IJENDA	38	85	37
N0005	56	F	RUKOKO	38	85	37
N0006	60	M	IJENDA	38	85	37
N0007	45	F	IJENDA	38	85	37
N0008	48	F	IJENDA	38	85	37
N0009	32	M	IJENDA	38	85	37
N0010	30	F	RUKOKO	38	85	37
N0011	28	M	IJENDA	38	85	37
N0012	46	F	IJENDA	38	85	37
N0013	48	M	RUKOKO	38	80	37
N0014	33	F	RUKOKO	38	80	37
N0015	42	F	IJENDA	38	85	37
N0016	32	M	IJENDA	38	80	37
N0017	31	M	IJENDA	38	85	37
N0018	29	M	IJENDA	38	80	37
N0019	22	M	IJENDA	38	85	37
N0020	34	F	IJENDA	38	80	36
N0021	36	F	RUKOKO	38	85	37
N0022	33	F	RUKOKO	38	80	37
N0023	23	M	RUKOKO	38	80	37
N0024	21	M	RUKOKO	38	85	38
N0025	21	F	IJENDA	38	80	37

Day 20: Mean temperature-38, cough-83.4 %, weight-37 kgs.

Table 6 Description of the clinical symptoms for the control group on day 25

No	Age	Sex	Location	Fever	Cough	Weight
N0001	16	F	IJENDA	38	80	37
N0002	14	F	IJENDA	38	80	37
N0003	30	M	RUKOKO	38	80	37
N0004	32	F	IJENDA	38	80	37
N0005	56	F	RUKOKO	38	80	37
N0006	60	M	IJENDA	38	80	37
N0007	45	F	IJENDA	38	80	37
N0008	48	F	IJENDA	38	80	37
N0009	32	M	IJENDA	38	80	37
N0010	30	F	RUKOKO	38	80	37
N0011	28	M	IJENDA	38	80	37
N0012	46	F	IJENDA	38	80	37
N0013	48	M	RUKOKO	38	80	37
N0014	33	F	RUKOKO	38	80	37
N0015	42	F	IJENDA	38	80	37
N0016	32	M	IJENDA	38	80	37
N0017	31	M	IJENDA	38	80	37
N0018	29	M	IJENDA	38	80	37
N0019	22	M	IJENDA	38	80	37
N0020	34	F	IJENDA	38	80	37
N0021	36	F	RUKOKO	38	80	37
N0022	33	F	RUKOKO	38	80	37
N0023	23	M	RUKOKO	38	80	37
N0024	21	M	RUKOKO	38	80	37
N0025	21	F	IJENDA	38	80	37

Day 25: Mean temperature-38 Celsius, cough-80 %, weight-37 kgs.

Table 7 Description of the clinical symptoms for the control group on day 30

No	Age	Sex	Location	Fever	Cough	Weight
N0001	16	F	IJENDA	38	80	37
N0002	14	F	IJENDA	38	80	37
N0003	30	M	RUKOKO	38	80	37
N0004	32	F	IJENDA	38	80	37
N0005	56	F	RUKOKO	38	80	37
N0006	60	M	IJENDA	38	80	37
N0007	45	F	IJENDA	38	80	37
N0008	48	F	IJENDA	38	80	37
N0009	32	M	IJENDA	38	80	37
N0010	30	F	RUKOKO	38	80	37
N0011	28	M	IJENDA	38	80	37
N0012	46	F	IJENDA	38	80	37
N0013	48	M	RUKOKO	38	80	37
N0014	33	F	RUKOKO	38	80	37
N0015	42	F	IJENDA	38	80	37
N0016	32	M	IJENDA	38	80	37
N0017	31	M	IJENDA	38	80	37
N0018	29	M	IJENDA	38	80	37
N0019	22	M	IJENDA	38	80	37
N0020	34	F	IJENDA	38	80	37
N0021	36	F	RUKOKO	38	80	37
N0022	33	F	RUKOKO	38	80	37
N0023	23	M	RUKOKO	38	80	37
N0024	21	M	RUKOKO	38	80	37
N0025	21	F	IJENDA	38	80	37

Day 30: Mean temperature-38 Celsius, cough-80 %, weight-37 kgs.

Citation: Gisenya P, Ogwang PE, Katotola E, et al. Pilot study to compare the use of the national program drugs ALONE versus their combination with *Artemisia Afra* infusions for the treatment of pulmonary tuberculosis. *Pharm Pharmacol Int J.* 2023;11(4):118–131. DOI: 10.15406/ppij.2023.11.00410

II. Exploratory group

Table 8 Description of the clinical symptoms for the exploratory group on day 0

No	Age	Sex	Location	Fever	Cough	Weight
N0001	32	M	IJENDA	40	100	37
N0002	30	M	IJENDA	40	100	36
N0003	34	F	MWARO	40	100	38
N0004	18	F	MWARO	41	100	38
N0005	16	M	IJENDA	42	100	37
N0006	14	F	MUSAGA	40	100	36
N0007	25	F	RUKOKO	39	100	37
N0008	29	F	MWARO	40	100	35
N0009	43	M	MATANA	40	100	39
N0010	44	M	KIBUMBU	39	100	38
N0011	46	M	KIBUMBU	40	100	35
N0012	50	F	IJENDA	40	100	36
N0013	43	F	MURUNGA	40	100	39
N0014	44	M	MUGONGO MANGA	40	100	34
N0015	46	F	IJENDA	39	100	39
N0016	22	F	KIBUMBU	39	100	35
N0017	34	M	MWARO	40	100	36
N0018	28	M	MUGONGO MANGA	40	100	38
N0019	20	M	RUKOKO	39	100	36
N0020	33	F	IJENDA	41	100	35
N0021	22	F	IJENDA	40	100	37
N0022	23	M	MWARO	40	100	34
N0023	23	F	MWARO	39	100	33
N0024	60	F	BIKANKA	41	100	33
N0025	42	M	BIKANKA	40	100	35

Day 0: Mean temperature-40 Celsius, cough-100%, weight-36 kgs

Table 9 Description of the clinical symptoms for the exploratory group on day 5

No	Age	Sex	Location	Fever	Cough	Weight
N0001	32	M	IJENDA	37	75	38
N0002	30	M	IJENDA	37	75	38
N0003	34	F	MWARO	37	75	39
N0004	18	F	MWARO	37	75	39
N0005	16	M	IJENDA	37	75	39
N0006	14	F	MUSAGA	37	75	39
N0007	25	F	RUKOKO	37	75	39
N0008	29	F	MWARO	37	75	36
N0009	43	M	MATANA	37	75	37
N0010	44	M	KIBUMBU	37	75	40
N0011	46	M	KIBUMBU	37	75	38
N0012	50	F	IJENDA	37	75	38
N0013	43	F	MURUNGA	37	75	40
N0014	44	M	MUGONGO MANGA	37	75	37
N0015	46	F	IJENDA	37	75	40
N0016	22	F	KIBUMBU	37	75	37
N0017	34	M	MWARO	37	75	38
N0018	28	M	MUGONGO MANGA	37	75	38
N0019	20	M	RUKOKO	37	75	39
N0020	33	F	IJENDA	37	75	40
N0021	22	F	IJENDA	37	75	40
N0022	23	M	MWARO	37	75	37
N0023	23	F	MWARO	37	75	38
N0024	60	F	BIKANKA	37	75	38
N0025	42	M	BIKANKA	37	75	38

Day 5: Mean temperature-37 Celsius, cough-75 %, weight-37 kgs

Table 10 Description of the clinical symptoms for the exploratory group on day 10

No	Age	Sex	Location	Fever	Cough	Weight
N0001	32	M	IJENDA	37	50	40
N0002	30	M	IJENDA	37	50	41
N0003	34	F	MWARO	37	50	40
N0004	18	F	MWARO	37	50	40
N0005	16	M	IJENDA	37	50	41
N0006	14	F	MUSAGA	37	50	40
N0007	25	F	RUKOKO	37	50	41
N0008	29	F	MWARO	37	50	41
N0009	43	M	MATANA	37	50	40
N0010	44	M	KIBUMBU	37	50	40
N0011	46	M	KIBUMBU	37	50	40
N0012	50	F	IJENDA	37	50	41
N0013	43	F	MURUNGA	37	50	39
N0014	44	M	MUGONGO MANGA	37	50	40
N0015	46	F	IJENDA	37	50	41
N0016	22	F	KIBUMBU	37	50	40
N0017	34	M	MWARO	37	50	40
N0018	28	M	MUGONGO MANGA	37	50	39
N0019	20	M	RUKOKO	37	50	40
N0020	33	F	IJENDA	37	50	40
N0021	22	F	IJENDA	37	50	40
N0022	23	M	MWARO	37	50	39
N0023	23	F	MWARO	37	50	39
N0024	60	F	BIKANKA	37	50	39
N0025	42	M	BIKANKA	37	50	41

Day 10: Mean temperature-37 Celsius, cough-50%, weight-40 kgs

Table 11 Description of the clinical symptoms for the exploratory group on day 15

No	Age	Sex	Location	Fever	Cough	Weight
N0001	32	M	IJENDA	37	25	42
N0002	30	M	IJENDA	37	25	43
N0003	34	F	MWARO	37	25	44
N0004	18	F	MWARO	37	25	42
N0005	16	M	IJENDA	37	25	40
N0006	14	F	MUSAGA	37	25	40
N0007	25	F	RUKOKO	37	25	42
N0008	29	F	MWARO	37	25	44
N0009	43	M	MATANA	37	25	44
N0010	44	M	KIBUMBU	37	25	42
N0011	46	M	KIBUMBU	37	25	43
N0012	50	F	IJENDA	37	25	43
N0013	43	F	MURUNGA	37	25	42
N0014	44	M	MUGONGO MANGA	37	25	42
N0015	46	F	IJENDA	37	25	43
N0016	22	F	KIBUMBU	37	25	42
N0017	34	M	MWARO	37	25	43
N0018	28	M	MUGONGO MANGA	37	25	42
N0019	20	M	RUKOKO	37	25	42
N0020	33	F	IJENDA	37	25	43
N0021	22	F	IJENDA	37	25	42
N0022	23	M	MWARO	37	25	42
N0023	23	F	MWARO	37	25	42
N0024	60	F	BIKANKA	37	25	44
N0025	42	M	BIKANKA	37	25	42

Day 15: Mean temperature-37 Celsius, cough-25%, weight-42.4 kgs

Citation: Gisenya P, Ogwang PE, Katotola E, et al. Pilot study to compare the use of the national program drugs ALONE versus their combination with *Artemisia Afra* infusions for the treatment of pulmonary tuberculosis. *Pharm Pharmacol Int J.* 2023;11(4):118–131. DOI: 10.15406/ppij.2023.11.00410

Table 12 Description of the clinical symptoms for the exploratory group on day 20

No	Age	Sex	Location	Fever	Cough	Weight
N0001	32	M	IJENDA	37	0	44
N0002	30	M	IJENDA	37	0	44
N0003	34	F	MWARO	37	0	46
N0004	18	F	MWARO	37	0	44
N0005	16	M	IJENDA	37	0	44
N0006	14	F	MUSAGA	37	0	45
N0007	25	F	RUKOKO	37	0	44
N0008	29	F	MWARO	37	0	46
N0009	43	M	MATANA	37	0	44
N0010	44	M	KIBUMBU	37	0	43
N0011	46	M	KIBUMBU	37	0	46
N0012	50	F	IJENDA	37	0	44
N0013	43	F	MURUNGA	37	0	44
N0014	44	M	MUGONGO MANGA	37	0	45
N0015	46	F	IJENDA	37	0	43
N0016	22	F	KIBUMBU	37	0	44
N0017	34	M	MWARO	37	0	43
N0018	28	M	MUGONGO MANGA	37	0	44
N0019	20	M	RUKOKO	37	0	45
N0020	33	F	IJENDA	37	0	44
N0021	22	F	IJENDA	37	0	45
N0022	23	M	MWARO	37	0	44
N0023	23	F	MWARO	37	0	44
N0024	60	F	BIKANKA	37	0	43
N0025	42	M	BIKANKA	37	0	44

Day 20: Mean temperature-37 Celsius, cough-0 %, weight-44.2 kgs

Table 13 Description of the clinical symptoms for the exploratory group on day 25

No	Age	Sex	Location	Fever	Cough	Weight
N0001	32	M	IJENDA	37	0	46
N0002	30	M	IJENDA	37	0	47
N0003	34	F	MWARO	37	0	46
N0004	18	F	MWARO	37	0	44
N0005	16	M	IJENDA	37	0	46
N0006	14	F	MUSAGA	37	0	47
N0007	25	F	RUKOKO	37	0	48
N0008	29	F	MWARO	37	0	46
N0009	43	M	MATANA	37	0	48
N0010	44	M	KIBUMBU	37	0	48
N0011	46	M	KIBUMBU	37	0	46
N0012	50	F	IJENDA	37	0	45
N0013	43	F	MURUNGA	37	0	45
N0014	44	M	MUGONGO MANGA	37	0	46
N0015	46	F	IJENDA	37	0	46
N0016	22	F	KIBUMBU	37	0	45
N0017	34	M	MWARO	37	0	45
N0018	28	M	MUGONGO MANGA	37	0	46
N0019	20	M	RUKOKO	37	0	46
N0020	33	F	IJENDA	37	0	46
N0021	22	F	IJENDA	37	0	46
N0022	23	M	MWARO	37	0	45
N0023	23	F	MWARO	37	0	47
N0024	60	F	BIKANKA	37	0	48
N0025	42	M	BIKANKA	37	0	47

Day 25: Mean temperature-37 Celsius, cough-0 %, weight-46.2 kgs

Citation: Gisenya P, Ogwang PE, Katotola E, et al. Pilot study to compare the use of the national program drugs ALONE versus their combination with *Artemisia Afra* infusions for the treatment of pulmonary tuberculosis. *Pharm Pharmacol Int J.* 2023;11(4):118–131. DOI: 10.15406/ppij.2023.11.00410

Table 14 Description of the clinical symptoms for the exploratory group on day 30

No	Age	Sex	Location	Fever	Cough	Weight
N0001	32	M	IJENDA	37	0	48
N0002	30	M	IJENDA	37	0	49
N0003	34	F	MWARO	37	0	48
N0004	18	F	MWARO	37	0	50
N0005	16	M	IJENDA	37	0	47
N0006	14	F	MUSAGA	37	0	48
N0007	25	F	RUKOKO	37	0	48
N0008	29	F	MWARO	37	0	49
N0009	43	M	MATANA	37	0	48
N0010	44	M	KIBUMBU	37	0	47
N0011	46	M	KIBUMBU	37	0	48
N0012	50	F	IJENDA	37	0	47
N0013	43	F	MURUNGA	37	0	48
N0014	44	M	MUGONGO MANGA	37	0	48
N0015	46	F	IJENDA	37	0	47
N0016	22	F	KIBUMBU	37	0	48
N0017	34	M	MWARO	37	0	49
N0018	28	M	MUGONGO MANGA	37	0	48
N0019	20	M	RUKOKO	37	0	48
N0020	33	F	IJENDA	37	0	47
N0021	22	F	IJENDA	37	0	48
N0022	23	M	MWARO	37	0	48
N0023	23	F	MWARO	37	0	48
N0024	60	F	BIKANKA	37	0	48
N0025	42	M	BIKANKA	37	0	48

Day 30: Mean temperature-37 Celsius, cough-0 %, weight-48 kgs

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