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Research Article

Strengthening HIV and Tuberculosis Integrated Co-infection Services: Mortality Ratios, Death Ratio and Contributing Factors in Rural Area Sindh in One Window HIV TB BMU

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Abstract

A major global health concern is the co-infection of HIV/AIDS and TB, which increases rates of morbidity and mortality. The mortality ratios linked to HIV with TB co-infection are examined in this article through an analysis of epidemiological data of one window Service Treatment center in rural area of Sindh Shaheed Benazir Abad District, This ART Treatment Centre is Managed both HIV and TB both coinfections at one center called One window Treatment Centre, underlying causes of elevated death rates in PLHIV with TB co-infection, and mitigation techniques. This research Article is based on the mortality ratios & death ratio in HIV with TB Patients in Different genders & age Groups. This research Article is Brief Practice Experience research on Patients Living with HIV and Having co Infection of TB, The Ratio of TB co-infection in HIV Positive Clints & their Mortality Ratios, Death Ratio and Contributing Factors in Rural Area Sindh among the registered Clints at HIV Treatment & Support Centre Nawab shah. Immunocompetent individuals have a 5-10% lifetime risk of tuberculosis, while HIV-positive individuals have a 5-15% annual risk of active tuberculosis disease. In the last twenty years, tuberculosis has become a significant opportunistic infection that exacerbates the HIV epidemic globally, especially in Asia and Africa and Poor Countries as Pakistan. This research is all based on Rural area Pakistan in Sindh province.

Keywords

PLHIV, HIV, AIDS, TB, TPT, ATT

1. Introduction

Two of the deadliest infectious diseases in the world are HIV and TB. HIV weakens the immune system, making a person more vulnerable to contracting TB, and TB speeds up the course of HIV disease. About 30% of AIDS-related deaths in 2019 were caused by tuberculosis (TB), according to the World Health Organization (WHO), making it the leading cause of death among individuals living with HIV. In this research Article we analysis the Mortality Ratios & death ratio of PLHIV with TB co-infection in rural area of Sindh Province where many marginalized populations are living, discuss their behavior their way of living life. Analysis is based on the PLHIV data that is managed & Treated by the

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HIV Treatment & Support Centre Peoples Medical University Hospital Nawab shah Shaheed Benazir Abad, is one window treatment Centre of HIV and AIDS with others coinfections Treatment facilities as like shown in following figure 1 of this Centre Board of available services. [2, 4, 5, 13].

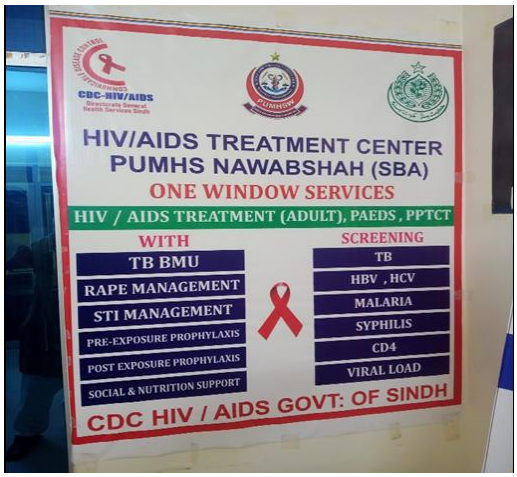

Figure 1. *One window center.*

2. Material & Methods

This cross-sectional study was conducted in ARV Treatment Centre in rural area of Sindh province, Pakistan established & started their services from 1st Nov 2020 to till date 19 Dec 2024 & Continuing their services & expend their services as a one Window Centre which Managed HIV Clints (ADULT, Pead's, PPTCT) in one door service also with other Coinfections like (TB, HBV, HCV, STI). A sample of newly Diagnosed 270 cases of HIV/AIDS which was registered & enrolled in this year of 2024 at this one window ARV Centre Peoples University Medical Hospital Nawab shah. [10].

This research is through consecutive sampling for TB testing & Data was collected by using close ended questionnaire & Gyn expert results of these PLHIV's. The variables were gender, age group, and marital status while research variable was mode of transmission of HIV. Age grouping of Clint was ordinal, and the other two were nominal data. All data were analyzed for frequency, percentage of TB infections in PLHIV and their death ratio of HIV with TB co infections through IBM SPSS V.21 (IBM Corp., Armonk, NY). [1, 14].

3. Results

Table 1. *Newley diagnosed PLHIV in 2024.*

Month	Male	Female	Child male	Child female	Transgender	Total
24-Jan	8	4	3	2	0	17
24-Feb	13	8	1	1	0	23
24-Mar	14	10	4	1	0	29
24-Apr	10	8	0	0	0	18
24-May	15	7	3	1	2	28
24-Jun	13	9	2	2	0	26
24-Jul	7	7	0	0	0	14
24-Aug	15	5	1	1	0	22
24-Sep	9	8	1	2	1	21
24-Oct	10	7	3	2	0	22

Month	Male	Female	Child male	Child female	Transgender	Total
24-Nov	7	5	1	8	3	24
24-Dec	3	1	1	4	0	9
Total year	124	79	20	24	6	253

Out of 253 patients of HIV, 124 (49%) were male and 79 (31.2%) was female and 20 (7.9%) were child male & 24 (9.5%) were Child female & 6 (3.6%) were Transgender Community. The modal age group of Adult PLHIV was of 20-29 years with 74 male and 59 female & 30 above 50 male & 20 females Out of 203 Adult patients of HIV and in Pead's of HIV patients are 1-5 years 11 child male 14 Child female and 5 years above are 9 Child Male & 10 Child female out of total 44 Pead's HIV Patients. 149 (58%) were married.

All 253 HIV Patients are Tested for TB & 23 (9%) patients are Declares TB positive with HIV in which 17 male & 6 females. Total 23 TB positive in which 15 were Pulmonary TB & 8 were Extra Pulmonary [1, 15].

3.1. Death Ratio

The 23 HIV with TB Patients are enrolled for ARV with ATT in One window ARV Centre in which 5 (21%) are died. According to this study 21% of patients who had both HIV and TB are died this percentage highlight the deadly synergy in Rural area of Pakistan between HIV and TB.

3.2. Co-infection Epidemiology of HIV/TB in World Wide

1.3 million people died from TB in 2021, including 170,000 HIV-positive individuals. In areas where both illnesses are highly prevalent, such as Southeast Asia and sub-Saharan Africa, the co-epidemic is especially severe. People with HIV are far more likely to get active TB in these places; studies show that their risk is 20 times higher than that of people without HIV [9, 3].

3.3. Burden of HIV-TB Coinfection

Pakistan is one of the countries with the highest burden of Pakistan ranks 5th with an estimated 518000 TB cases, including 15 000 MDR-TB cases and HIV infection (250000 cases). TB occurs in all socio-economic and ethnic groups, but its prevalence is clearly associated with poverty. Malnutrition, HIV, smoking, and diabetes are all estimated to be strong risk factors for TB. TB in HIV-infected women is a risk factor for HIV transmission to their children and is associated with preterm birth, low birth weight, and increased maternal and child mortality. Patients with advanced immunodeficiency are at high risk of developing rifampicin resistance when treated with twice- or thrice-weekly doses. This may be due to poor absorption and low blood levels of anti-TB drugs. Although cure rates with standard TB treatment regimens average 86%, HIV-infected individuals have a worse outcome than non-infected individuals. Although most HIV-infected patients initially respond well to anti-TB treatment, they are at significant risk of developing other opportunistic infections in addition to recurrent TB, leading to high mortality. Timely initiation of antiretroviral therapy has been shown to reduce mortality and improve long-term outcomes in these patients. Several studies have now shown that early initiation of ART (within the first few weeks after ATT) reduces mortality and improves TB results. The choice of ART regimen depends on the interactions between anti tuberculous and antiretroviral drugs. Rifampicin is an inducer of the cytochrome P450 enzyme system that metabolizes the NNRTI drugs nevirapine and efavirenz. The metabolism of the latter is less affected by rifampicin, so efavirenz in combination with ATT is the NNRTI of choice [6-8].

3.4. Death Rates in Co-infection with HIV/TB Worldwide

Patients who have both HIV and TB have significantly greater mortality rates than those who only have one of the diseases. Patients with TB and HIV co-infection have much greater mortality rates than those with TB or HIV mono-infection, according to a comprehensive analysis. According to another study, 5.3% of patients who had both HIV and TB died. These figures highlight the deadly synergy between HIV and TB [16, 17, 12].

4. Discussion

The higher death rate seen in people with HIV/TB co-infection is caused by a number of factors:

1) Immunosuppression: The body's capacity to regulate TB infection is compromised by HIV-induced immunosuppression, which results in more severe disease symptoms and consequences.
2) Delayed Diagnosis: Patients with HIV may exhibit unusual TB symptoms, which can cause delays in diagnosis and treatment beginning, which has a negative impact on results.
3) Drug Interactions and Toxicity: When antiretroviral

therapy (ART) and TB treatment are used together, there may be drug-drug interactions and increased toxicity, which can make adherence and management more difficult.

4) Socioeconomic Factors: Poverty, lack of knowledge, and restricted access to healthcare might make it more difficult to receive prompt diagnosis and treatment, which raises death rates.
5) Delayed treatment of patients of TB because of No service of one window (HIV with TB at one Centre) in rural areas of Sindh which increase the death ratio in rural areas as compared to the world Wide [11].

5. Conclusion

Co-infection of TB and HIV raises mortality rates dramatically, creating a difficult public health issue. Developing successful therapies requires an understanding of the mechanisms behind this higher mortality. To lower the death rate linked to HIV/TB co-infection, integrated healthcare services known as One window Service Centre one Door service Centre in which early ART introduction, preventative medicines & TB ATT started & patents are not suffered and tackling socioeconomic determinants are crucial tactics. lack of One window Service Centre in Rural areas of Pakistan is Increasing the death ratio in HIV with TB patients as compared to the World wide death ratio.

6. Recommendation

A diversified strategy is needed to address the high death rate linked to HIV/TB co-infection:

1) Integrated Care treatments: By combining HIV and TB treatments, it is possible to improve patient outcomes by facilitating early detection and coordinated treatment as Like one Window Service or One door Service for these Both Disease for the Patients.
2) Early ART Initiation: It has been demonstrated that prompt antiretroviral medication initiation in co-infected patients lowers mortality by re-establishing immune function.
3) Preventive Therapy: By administering TB preventive therapy to people with HIV, the incidence of active TB and related mortality can be decreased. Every HIV Patients who had Negative TB initiated TPT for 9 months at least.
4) Addressing Social Determinants: Improving access to healthcare and socioeconomic circumstances can improve treatment compliance and lower mortality. this can also a man reason in increasing of death ratio in rural areas Vs World Wide.
5) Increased case finding, infection control, isoniazid preventive chemotherapy, and the integration of TB and HIV services into antenatal, PMTCT, family planning, and immunization services are all part of a policy to address co-infection of TB and HIV. Given that HIV is now a chronic, treatable illness, the task at hand is to strengthen health systems and offer patients integrated services so that long-term care can be delivered efficiently. Improved and more sensitive point-of-care TB diagnostics, shorter and more efficient TB treatment plans with fewer drug interactions with antiretroviral medications, and an improved TB vaccine that is safe and effective in HIV-infected populations are among the top research priorities [11].

Abbreviations

PLHIV	Patient Living with HIV
HIV	Human Immunodeficiency Virus
AIDS	Acquired Immunodeficiency Syndrome
TB	Tuberculosis
TPT	TB Preventive Therapy
ATT	Anti TB Treatment

Author Contributions

Ubedullah Malik: Conceptualization, Investigation, Data Curation & Data Analysis.

Ghulam Qadir Rajpoot: Supervision, Methodology, Validation.

Sasui Wadhoo: Resources, Project Administration, TB HIV analysis at Provincial Level.

Paras Tunio: Formal Analysis, Visualization, Writing Original draft.

Approval of the Submitted Version of the Manuscript

Please check this box to confirm that all co-authors have read and approved the version of the manuscript that is submitted. Signatures are not required.

Conflicts of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. The authors declare no any financial interests/personal relationships which may be considered as potential competing interests.

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Biography

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