

## Hypertension and Isolated Office Hypertension in HIV-Infected Patients Determined by Ambulatory Blood Pressure Monitoring: Prevalence and Risk Factors

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### Abstract

*This review extensively evaluated literatures related to the subject, and assessed the structure, accuracy currency, authority, relevance, objectivity and stability of the article. Other sections assessed were the analysis of the tables, appraisal of the recent advances on the topic in addition to the credibility and accessibility of the article. The study has its objective as determining the prevalence as well as the risk factors of hypertension and isolated office hypertension (IOH), among people living with HIV/AIDS. The study was a cross-sectional study that used a 24-hour ambulatory blood monitor to measure the blood pressure of the participants. A prevalence of 14.8% for hypertension and 5.5% for isolated office hypertension was recorded in the study amongst others. The study also found hypertension to be strongly associated with family history of hypertension, age, male gender and number of antiretroviral regimens. Largely, the article is an objective, credible and relevant scholarly piece which has contributed significantly to the body of knowledge in this important field of HIV/AIDS. Hypertension with its attendant cardiovascular morbidities/mortalities expected in the rising aging population of HIV infected patients underscores the importance and timely nature of this work. It will be useful to clinicians, researchers, academicians and donor agencies sponsoring HIV/AIDS programs. The article is current, accessible and relevant for clinical services, further research, academic purposes and policy decision making in HIV/AIDS programs.*

**Keywords:** Hypertension, Isolated office hypertension, Prevalence, Risk factors, HIV infected patients, Ambulatory Blood Pressure Monitoring.

### Introduction

This work is a critical review of the article titled “Hypertension and Isolated Office Hypertension in patients infected with HIV determined by Ambulatory Blood Pressure Monitoring: Prevalence and Risk Factors” written by Bernardino Jose Ignacio, Mora Marta, Zamora Francisco Xavier, Arribas Blanca, Montes Maria Luisa, Pascual-Pareja Francisco, Jose Belen San, Peña Jose Maria & Arribas Jose Ramon in the Journal of Acquired Immune Deficiency Syndromes. This topic is relevant as the available data about the prevalence of Hypertension among People Living With HIV/AIDS (PLWHAs) is conflicting ranging from 5% to 38%, while some studies show high prevalence in comparison to the general public, others show low prevalence, therefore, the need to carry out this type of study especially using Ambulatory blood pressure monitoring (ABPM) which has numerous benefits over office Blood Pressure (BP) monitoring, thereby revealing the actual prevalence of hypertension among PLWHAs in addition to associated cardiovascular risk factors. At the first instance, the review evaluated the literatures relevant to the topic besides delineating the summary of the article. Then, it briefly analyzed the effectiveness of the structure of the article; undertook an exploration of the information flow to determine whether it can be efficiently accessed while reading the article. Furthermore, the review critiqued the article, in view of its authority, currency, accuracy, relevance, objectivity and stability. The tables were

analyzed; appraisal of recent advances related to the topic was done before lastly looking into the credibility as well as the accessibility of the article.

## **Review of literature**

According to Irish Heart Foundation report, Ambulatory blood pressure monitoring refers to the process of measuring blood pressure at regular intervals for instance every 15–30 minutes, in a 24-hour period while the client goes about his or her routine daily activities. The Blood Pressure is measured both day & night while client is asleep. This is the added advantage over office blood pressure measurement. It further states that ABPM is better than single BP measurement which can mislead because it gives a snapshot only, of Blood Pressure behavior. It is now well known that Blood Pressure can vary extensively over a 24 hour period. ABPM therefore is the most reliable way of measuring blood pressure as it also measures night time blood pressure which gives valuable information and can predict potential problems associated with high blood pressure. ABPM is now recommended in UK for all patients suspected of having hypertension.

The SpaceLabs 90207 ambulatory monitor was recommended for ambulatory blood measurement following the validation research work done by O'Brien et al, (1991), a group of independent investigators which reported that the device achieved a B rating by the standards of British Hypertension Society protocol for diastolic and systolic blood pressure measurement as well as fulfilled the criteria set by the Association for the Advancement of Medical Instrumentation for diastolic and systolic blood pressure measurement. This validation of Spacelabs 90207 oscillometric monitor was reaffirmed by Xavier et al, (2013).

In view of the cardiovascular complications associated with HIV/AIDS, study of Hypertension and risk factors prevalence among PLWHAs is of utmost importance. In the study by Saves et al, (2003), as well as Bergersen et al (2003), it was reported that hypertension prevalence was lower than that of the control group. However, some authors like Carmine et al (2003) and Baekken et al, (2008) reported higher prevalence of 34.2% and 36.5% respectively. Furthermore, Bavinger et al, (2013) reported that some recent research studies revealed that certain types of Anti-retroviral drugs may be linked with an increased risk of cardiovascular diseases. This is of great concern because PLWHAs may be on these drugs for many decades.

## **Article summary**

The objective of the study was to determine the Hypertension prevalence and Isolated Office Hypertension (IOH) prevalence, and risk factors among PLWHAs. A Hospital-based cross sectional survey of patients selected randomly at the Hospital La Paz HIV Unit in Madrid, where comprehensive care was given to HIV-infected adults.

Hypertension and IOH were diagnosed using 2007 European Society of Cardiology and European Society of Hypertension guidelines and the researchers obtained patients' information on prescribed drugs and laboratory outcomes from clinical records/Lab databank.

Arm, waist & hip circumferences, weight & height were measured. Bioelectrical Impedance meter (OMRON BF400) was used to measure total body fat. All Blood pressure readings were taken with a validated semiautomatic oscillometric device (Omron HEM 7001-E. Omron Corp, Tokyo, Japan). For ambulatory monitoring assessment, a 24-hour (morning to morning) ABPM was done using a validated oscillometric device (Spacelabs 90207) with the BP readings set at interval of 15-minutes in the daytime (from hours of 07 AM to 10 PM) & 20-minute intervals during night (from 11 PM to 07 AM).

The result revealed 15% prevalence of hypertension & 39% of these had IOH, underscoring the importance of ABPM for hypertension confirmation. Furthermore, hypertensive HIV patients were older, in longer duration of the infection, with lower cd4 & have lipodystrophy, are more likely to be taking anti-retroviral medications, and had more cardiovascular risk factors than their normotensive counterparts. Moreover, age, male gender,

family history of hypertension & number of anti-retroviral regimens increased the risk of hypertension. On circadian rhythm, 5% were extreme dippers, and 12% were risers.

### **Article structure**

The article was presented starting with the title, authors & author information. This was trailed by the abstract, succinctly presenting the objectives, methods, results and conclusion, thus, giving a quick overview of the work. The main text followed, and is presented with appropriate sections as is normally required with research report of this category facilitating easy access to any desired information. The under listed sections applied to this report: introduction, patients and methods, results, discussions & summary, acknowledgments & references. The introduction section explained the background of the problem, supported by the literatures reviewed, uncovered the existing gap in research regarding the hypertension prevalence/cardiovascular risk factors among PLWHAs, as well, stated the hypothesis that guided the research. The Patients and methods section stated the study design, population and study area. The instruments of data collection, measurements & definitions as well as data analysis techniques were clearly demonstrated. Also documented is the ethical approval & patients consent.

Further, the result section presented the important findings of the study addressing the objectives of the work with appropriate use of tables to support and illustrate the findings for clear understanding of the results.

Discussion section brought to bear, the area of strength and comparative advantage of this research over previous ones as regards use of ABPM to confirm hypertension especially among PLWHAs. The objectives of the research as achieved were focused on and compared with previous researches in the subject area. Moreover, the limitation of the study was acknowledged especially as it concerns small sample size, BP measurement only on a single day, use of clinical definition for lipoatrophy and use of number of antiretroviral drugs as an indirect measurement of duration of therapy.

The summary section was incorporated into the discussion section, which should have been on separate section for easy access to the reader; nevertheless, it was clear, concise and unambiguous bringing out the substance of the whole research work. On the whole, the main text of the article was very well written and presented.

### **Critique**

#### **Authority**

Journal of Acquired Immune Deficiency Syndromes (JAIDS) is a reliable multidisciplinary material for HIV and AIDS-related issues with editors who are distinguished in fields of clinical virology, epidemiology & molecular biology. JAIDS publishes peer-reviewed articles on HIV/AIDS related information from around the globe which are indexed / abstracted in MEDLINE/PUBMED, COPUS, BIOSIS, biological sciences/life sciences, PsychINFO and others. The authors are authority in the HIV/AIDS discipline, some of whom are clinicians who manage HIV infected patients and seasoned researchers in the subject with the university hospital, while some are biostatisticians who are working in the biostatistics department of the university, with many years of research experience.

#### **Accuracy**

The Accuracy Of The Article Is Supported By The Fact That The Information Was Extracted From A Recent Research Work Of Less Than Five Years Old. As Well, Most Of The References As Cited In The Text Were Current Research Works On The Subject Of Study, Thereby, Supporting The Accurateness Of The Article. Moreover, JAIDS Publishers Take On A Rigorous Peer Review And Editorial Process By Their Editors Who Are Experts In The Field Of HIV/AIDS When Reviewing Articles For Acceptance For Publication, Thus, Only Thoroughly Scrutinized Articles With High Level Of Accuracy Make It The Press. Generally Speaking, The Accuracy Of The Article Is Of Acceptable Standard.

### **Currency**

This work was received by journal of acquired immune deficiency syndromes (JAIDS) on 6th February, 2011, accepted for publication on 26th may, 2011 and subsequently published on 1st September, 2011; therefore, this is a recent as well as current research study. Besides, the cited references used for the study are current works most of which were done between 2003 and 2010. This article dealt with a present-day health challenge as it affects people living with HIV & aids, a contemporary health problem needing urgent research attention and intervention to curb its rising tide. This article is a work that can actually be relied upon.

### **Relevance**

Journal of Acquired Immune Deficiency Syndromes (JAIDS) is a thorough peer reviewed journal relevant for students, academicians, health professionals, policy makers, donor agencies, all of whom have interest in HIV/AIDS related issues around the world. This article was published to inform clinicians, researchers, academicians, healthcare professionals as well as organizations involved in the care/treatment of PLWHAs & HIV/AIDS programming globally. The article is very relevant to HIV/AIDS researchers for further research, to clinicians and health care professionals for accurate diagnosis and effective treatment, to academicians for teaching and to donor organizations for decision regarding improved funding and better program planning /implementations.

### **Objectivity**

The article in focus is very objective. The research design is highly standardized, and meticulously conducted following the rigors associated a hospital based study. The objective which very was clear was achieved as evidenced from the findings of the research work. The references cited were current and appropriate, these were also well acknowledged. The sample population as stated was HIV positive adults who are 18 years and above, attending regular clinic appointments at the Hospital of study. Exclusion criteria were also documented appropriately, thus, the study can be generalized for other PLWHAs attending clinic elsewhere and can be repeated following the clearly laid down methodology as used in this index study.

### **Stability**

Journal of Acquired Immune Deficiency Syndromes (JAIDS) is trusted peer-review journal of high repute, being the source of this article confers considerable stability to the work. The information can be used for decision making in the following settings amongst others: clinical management of HIV/AIDS cases, program planning for HIV/AIDS activities, allocation of funds for HIV/AIDS programs etc. It can also be used by academicians for teaching and researchers for further research reference.

### **Analysis of graph/Chart/Table**

Table 1: Baseline characteristics of the study population (n=310)

The social-demographic characteristics, cardiovascular risk factors, the laboratory parameters and the drug regimen of the patients were clearly presented. The information presented are needful, unambiguous, well organized and easily assessable.

Figure 1: Patient study disposition

This is a clear schematic presentation of the patients' disposition as regards prior hypertension, isolated office hypertension, ABPM hypertension and normal blood pressure. The figure is relevant giving the actual figures for ease of comprehension by the reader.

Table 2: Prevalence of different hypertension definitions

The table is very relevant, presenting the prevalence of the different hypertension definitions in a clear and concise outline, aiding the reader to appreciate the result.

Table 3: Clinical characteristics of hypertensive and normotensive patients

This is an important table that helps a reader to compare the clinical characteristics of the hypertensive and normotensive HIV infected patients. It is clearly documented and easy to comprehend.

Table 4: Adjusted odds ratio of factors associated with hypertension

Table 4 is relevant in understanding the factors associated with hypertension which is one of the objectives of the study. It's unambiguous and very well presented, distinguishing the univariate and multivariate analysis of these factors.

## Conclusion

This review of the article 'Hypertension and Isolated Office Hypertension in HIV-Infected Patients Determined by Ambulatory Blood Pressure Monitoring: Prevalence and Risk Factors' has appraised and critiqued the content & structure of the work as well as evaluated the merits and weaknesses of the study. Largely, the article is an objective, credible and relevant scholarly piece which has contributed significantly to the body of knowledge in this important field of HIV/AIDS. Hypertension with its attendant cardiovascular morbidities/mortalities expected in the rising aging population of HIV infected patients underscores the importance and timely nature of this work. There is the need to have accurate data so that an informed evidenced based intermediation can be introduced to reduce the mortality and morbidity associated with hypertension among this population of PLWHAs. This study will be of immense importance to clinicians who are managing HIV/AIDS cases as there is need to accurately diagnose hypertension among this group as well as associated risk factors for proper. Furthermore, donor agencies sponsoring HIV/AIDS programs will benefit from the work for informed decision on funding of the activities and programming. Researchers and academicians are not left out as the information will be beneficial for teaching and further research. The article is current, accessible and relevant for clinical services, further research, academic purposes and policy decision making in HIV/AIDS programs.

## Recent advances related to the topic

The SpaceLabs 90207 ambulatory monitor was used for this study. It is a standard and validated Ambulatory Blood Pressure monitor recommended by British Hypertension Society (BHS) and Association for the Advancement of Medical Instrumentation (O'Brien et.al, 2001). This device is used to measure peripheral blood pressure but not able to measure central blood pressure (pressure in the aorta).

According to Uscom (2014), Central blood pressure is the pressure in the aorta, the large artery that receives blood directly from the heart. It has become of increased health importance having been shown to relate to vascular disease and outcome more than traditional upper arm (peripheral) blood pressure (Roman et.al, 2009). The central blood pressure can distinguish between the effects of various hypertension drugs where peripheral blood pressure and pulse wave velocity do not (Boutouyrie et.al, 2010). Central blood pressure is that pressure that the heart must overcome to pump blood to all parts of the body. The higher the central blood pressures, the harder the heart must work to pump blood to the rest of the body and this can cause the heart to fail over time (Avolio, 2008).

Previously, Central blood pressure can be measured only directly using a pressure sensor or catheter inserted into the aorta which is invasive and can cause serious complications.

However, advances in medical sciences have led to discovery of non-invasive way of measuring CBP which is by tonometric and the more recent oscillometric techniques. This later technique is growing in popularity and do not have the challenge of calibration & operator dependency as encountered in tonometric technique (Black, 2015).

The recent advance in the ambulatory blood pressure measurement is that new devices has been developed which can now measure the ambulatory blood pressure (peripheral blood pressure) and at the same time measure the central blood pressure non-invasively. This is the case with - SunTech Medical and AtCor Medical who have been given clearance from the

United States Food and Drug Administration for U.S. distribution of their jointly developed Oscar 2 ambulatory blood pressure monitor (ABPM) with SphygmoCor Inside, a device that provides noninvasive measures of central arterial pressure waveforms, central aortic blood pressures and arterial stiffness indices, in addition to the highly-accurate data associated with a 24-hour ABPM measurement.

**Source:** Bernardino Jose Ignacio et, al, 2011, ‘Hypertension and Isolated Office Hypertension in HIV-Infected Patients Determined By Ambulatory Blood Pressure Monitoring: Prevalence and Risk Factors’, JAIDS: Journal of Acquired Immune Deficiency Syndromes, 1 September 2011 - Volume 58 - Issue 1 - pp 54-59doi: 10.1097/QAI.0b013e3182267406.

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