Central Blood Pressure in Aldosterone Escape
IRB Draft
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A. Study Purpose and Rationale

The goal of the study is to evaluate aldosterone escape in patients on ACEi/ARBs and evaluate whether aldosterone escape correlates with increased central blood pressure. Ideally, patients on ACEi/ARBs should have their renin-angiotensin-aldosterone axis downregulated, but up to 30% of patients on ACEi have a phenomenon known as aldosterone escape, with elevated aldosterone in spite of ACE inhibition (Staessen 1981, Bomback 2007). Interestingly, aldosterone escape can occur in patients who nonetheless have normal peripheral blood pressures (Staessen 1981, Lijnen 1982). However, peripheral blood pressure does not reliably correlate with central blood pressure (Williams B, 2006), and central blood pressure has been shown in certain cases to be a better prognostic indicator for cardiovascular disease (Roman MJ, 2007). In order to evaluate whether aldosterone escape increases CBP in patients with aldosterone escape relative to those without aldosterone escape, this cross-sectional study will evaluate aldosterone and central blood pressures in patients on ACEi/ARBs with well-controlled peripheral blood pressures.

B. Study Design and Statistical Analysis

This will be a cross-sectional, observational study. Volunteers in AIM clinic who have well-controlled peripheral blood pressures (<140/90), who have been on ACEi/ARB for >1 year, who are not on other anti-hypertensives and who do not have a diagnosis of secondary hypertension will have aldosterone levels drawn and a central blood pressure taken. Patients with or without aldosterone escape, defined as >15 ng/dL (MacFayden, 1999) will have their mean central arterial pressure compared using a t-test to determine if there is a clinically significant difference in mean CBP between the two groups.

Approximately 30% of subjects are expected to have aldosterone escape on the basis of prior literature (Bomback, 2007). For $\alpha = 0.05$ and power = 80%, given a standard deviation of ~4mm Hg for the distribution of normal blood pressures (assuming a range of MAP from 90 to 105), 50 subjects in the group without aldosterone escape and 20 subjects with aldosterone escape will be required to show a difference of 3mmHg between the two groups (www.biomath.info/crc)

C. Study Procedures

Each patient will have a central blood pressure taken with the SphygmoCor system (AtCor Medical, Itasca IL), a process that takes about 10 min and is non-invasive. At the same visit, the patient will have an aldosterone level drawn. In pts on a normal salt diet, aldosterone does not have a marked diurnal variation, and the variations of aldosterone with respect to time are a magnitude of order smaller than the actual measurement (pg/ml vs. ng/dl) (Katz FH, 1975).

D. Study Drugs

No Drugs will be used during the course of this study.

E. Medical Device

No medical device will be used during the course of this study

F. Study Questionnaire

No Questionnaire will be used during the course of this study

G. Study Subjects

Study subjects will be recruited from volunteers at AIM clinic. Selection of subjects will not be restricted by gender or race. One vulnerable population that the study will investigate is the elderly, many of whom are on ACEi/ARBs. However, the proposed intervention of a non-invasive central blood pressure and routine blood draw does not pose them any undue risk.

The patients who are chosen will be those who have been on an ACEi/ARBs for >1 year, are not on other anti-hypertensives, are currently well-controlled with regard to their peripheral blood pressure (<140/90), and do not have a diagnosis of secondary hypertension.

H. Recruitment of Subjects

Primary care providers at AIM clinic will be made aware that a study to evaluate aldosterone escape in patients on ACE inhibitors is underway and will be asked to apprise their patients that such a study is taking place. If the PCP determines that the patient is suitable for the study and willing to discuss the study with the investigators, then subjects will be consented and asked by investigators during the course of their AIM clinic visit whether they want to have additional blood drawn and a central blood pressure taken for the purpose of a study. Consent will be obtained by the investigators at the time of the recruitment into the study by means of the patient's signature. If the patient is non-English speaking, a phone interpreter will be provided.

I. Confidentiality of Subject Data

Only investigators will collect patient data, and only investigators will examine identifiable patient data. All patient information collected during the course of the study will have patient identifiers removed and linked to a unique study identification number prior to statistical analysis of the data. The link between the anonymized data and the corresponding medical record number will be stored in a password-secure database on a password-protected computer in a locked room. Publication of information related to patient related material will not include any patient identifying information. The link between the study number and the patient's MRN will be erased after data analysis is concluded.

J. Potential Conflict of Interest

No potential conflicts of interest are currently anticipated from either an investigator or the university, so no disclosures need to be made. No individual or organization stands to benefit from the results of this study. There are no drugs, devices, or procedures currently under investigation.

K. Location of the Study

The study will take place at CUMC in the Department of Medicine and its associated outpatient clinics

L. Potential Risks

Potential risks to the patient are those associated with routine blood draws, including bleeding, hematoma, phlebitis. There are no risks anticipated from non-invasive measurement of central blood pressure. There is a potential risk of disclosure of patient information that will be guarded against by anonymizing information and keeping it in an encrypted database on a password protected computer in a locked room.

M. Potential Benefits

The patient will receive no benefit beyond standard of care, namely evaluation of an aldosterone level for those on long-term ACE inhibition. Benefit to clinical medicine could include contributing to the determination of whether aldosterone escape is a phenomenon leading to real clinical consequences.

N. Alternative Therapies
No therapy is being offered during the course of this study, so there are no alternatives to therapy.

O. Compensation of Subjects
Subjects will not be compensated

P. Costs to Subjects
The cost to the subject will be the 10-20 minutes of time it takes to acquire a central blood pressure and draw labs for aldosterone level.

Q. Minors as Research Subjects
Minors will not be included in this study

R. Radiation or Radioactive Substances
No radiation or radioactive substances will be used in this study.

References
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