

## HIV positive outpatients with treated hypertension: failure to achieve blood pressure targets

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## Background

- 45% of heart disease deaths and 51% of stroke deaths are attributable to hypertension (WHO 2013)
- Prevalence of hypertension in Australia
  - 32% (4.6 million) of adults aged >18yo (2011/2012 Australian Heart Foundation)
  - > 2/3 of cases (68%) uncontrolled or unmanaged (not taking antihypertensives)
- Hypertension in Australian HIV cohort
  - 20-28% (Trevillyan 2012, Chan 2013)
- Prevalence of hypertension in international HIV cohorts
  - 25-35% (Nuesch 2013, Mateen 2013)
- Hypertensive HIV patients
  - Higher risk of AMI than age-matched non-HIV hypertensive cohort (Armah 2013)
  - Poorer neurocognitive performance (Wright, 2008)
- Evaluation of blood pressure control in HIV+ patients in Australia has not been undertaken as yet



## Methods

- Study site**
  - Alfred Hospital, Melbourne: state-wide referral centre for HIV+ people
  - Approximately 740 people attend for regular follow-up yearly
- Study design**
  - Cross-sectional, retrospective study of HIV+ patients regularly attending the Alfred Hospital Infectious Diseases Outpatient Clinic
- Study period**
  - 10 March 2010 – 31 March 2013
- Inclusion Criteria**
  - HIV+ outpatients who attended the Alfred Hospital for regular care (> 2 visits/annum)
  - and
  - had a diagnosis of HT in the Alfred HIV database
  - and/or
  - had script for anti-HT agents on Alfred pharmacy database in past 3 years
  - and
  - BP reading documented in the last 12 months of audit period



## Methods

### Data collected

- HIV viral load and CD4+ cell count
- Most recently recorded systolic and diastolic BP measurements
- Record of anti-HT medications in OPD notes, scripts, medication reconciliations, or inpatient notes received during past 12 months
- Documentation in notes of proteinuria > 1gm/day, CKD, CHD, CVA/TIA, DM, proteinuria > 300mg/day
- Whether patient was reviewed by Alfred Hospital cardiology/renal OPD during past 12 months, yes/no
- Start date of HT medications: not ascertainable



## Methods

- Study definitions**
  - Regular attendance: >2 more clinic visits per annum
  - Hypertension: diagnosis noted in patient's record
  - Blood Pressure targets: as per the Heart Foundation, 2010
- Statistical analyses**
  - Univariate and multivariate analyses



## Heart Foundation Guide (2010): Blood pressure treatment targets

Patient Group	Target BP (mmHg)
Proteinuria > 1g daily	< 125/75
Associated conditions /end-organ damage	< 130/80
<ul style="list-style-type: none"> <li>Coronary heart disease</li> <li>Diabetes</li> <li>Chronic Kidney Disease</li> <li>Proteinuria &gt; 300mg daily</li> <li>Stroke / TIA</li> </ul>	
None of the above	< 140/90



Guide to Management of Hypertension, National Heart Foundation Australia, 2010 update



## Heart Foundation Guide (2010): Recommended Treatment

- First choice, low dose
  - ACE/ARB or Ca+ channel blocker or thiazide diuretic (age >65yo)
- If target BP not reached: add a second agent
  - ACE/ARB plus Ca+ channel blocker
  - ACE/ARB plus thiazide diuretic
- If target BP not reached:
  - Increase dose of one agent to maximum, then increase dose of second agent
- If target BP not reached:
  - ACE/ARB plus Ca+ channel blocker plus thiazide diuretic
- Referral to a specialist

## Results n=69

<b>Gender, male</b>	67 (97%)
<b>Age (avg), yrs</b>	55 (R: 27 – 75)
<b>Smoking status, n</b>	
Smoker	17 (25%)
Ex-smoker	23 (33%)
Non-smoker	29 (42%)
<b>CD4+ count (avg), (cells/<math>\mu</math>L)</b>	616 (R: 64 – 1907)
<b>CD4+ nadir (avg) (cells/<math>\mu</math>L)</b>	164 (R: 0 - 555)
<b>AIDS defining illness, n</b>	29 (42%)
<b>Plasma HIV viral load undetectable</b>	59 (85%)

## Results

- **Target BP achieved**
  - N=33/69 (48%)
- **End-organ disease profile**
  - End-organ disease present: n=41 (59%)
    - CHD, CKD, DM, CVA/TIA, Protein > 300mg/day
  - Proteinuria > 1gm/day: n=1
  - None: n=27 (39%)

## Results

- **Treatment**
  - ACE inhibitors: n=39
  - AIIIRB: n=12
  - AIIIRB + thiazide: n=7
  - Calcium channel blocker: n=16
  - Thiazide diuretic alone : 0
  - Beta blocker: 20

## Results

- **Number of antihypertensive drugs used**
  - 1 drug only: 48 patients (70%)
  - > 1 drug: 21 patients (30%)
    - 17 were on two anti-HT drugs
    - 4 were on three anti-HT drugs
- **Specialist referral to cardiology or renal OPD clinics at The Alfred Hospital in previous 12 months**
  - Overall 34/66 (51%) evaluable patients referred
  - 28/41 (68%) patients with end-organ damage referred
  - 10/34 (30%) patients seeing specialists were on 2 or more anti-HT agents

## Results

### Association between BP control and baseline variables

- **Univariate analysis**
  - Age  $\geq$  55 years (OR 2.66 (1.00-7.09; p 0.05))
  - HIV viral load < 20 copies/ml (OR 5.25 (1.00-27.45, p 0.05))
  - CV disease history (OR 2.44 (0.90-6.66, p 0.08))
- **Multivariate analysis**
  - Specialist referral (OR 4.44 (1.09-18.07, p 0.04))

## Summary and Discussion

- **48% patients have achieved BP control**
  - Concern because increased risk of CVD in HIV+ people
- **59% have significant end-organ disease**
  - 68% of those received specialist referral
  - Referral rates should increase
- **HT medication drug choices accorded fairly well with Heart Foundation Guidelines**
  - No inappropriate prescription of thiazide diuretics or older agents
  - Use of beta-blockers likely related to heart failure or previous Acute Coronary Syndrome

## Discussion

- **Poor uptake of Heart Foundation advice to use dual or triple anti-HT treatment to manage refractory hypertension**
  - Only 30% patients on 2 or more anti-HT medications
  - This may reflect inexperience and reluctance of ID physicians and general practitioners to manage refractory hypertension and/or add to the patient's pill burden
- **Specialist referral was significantly associated with better BP control**
  - May reflect more appropriate doses of single agents, closer BP monitoring and greater ease in commencing dual or triple therapy
- **Hypertension better controlled in older patients**
  - Doesn't reflect Australian data where uncontrolled hypertension increases with age (Australian Heart Foundation 2011/2012)
  - However, ARV adherence better in older patients living in high-income countries (Langebeek, 2014). Perhaps a carry over effect to other medications?
- **Virologically suppressed patients have better BP control**
  - May reflect better medication adherence overall
  - Health literacy / ownership

## Limitations

- Small sample size, retrospective study design
- Impact on ARVs on hypertension – data under analysis
- Single measurement of BP readings recorded only
- Did not/could not measure duration of antihypertensive therapy
- Did not measure lipid profiles or all modifiable factors including alcohol intake, exercise and diet

## Thank You