

|                                  | All (70.264) | All HF (5703) | VA HF (3010) | nVA HF (2693) |
|----------------------------------|--------------|---------------|--------------|---------------|
| Men:Women                        | 60:40        | 71:29         | 99:1         | 39:61         |
| White:Black:Unknown              | 42:31:25     | 45:31:23      | 59:30:11     | 30:33:36      |
| Age, years                       | 61.3         | 70.4          | 70.3         | 70.6          |
| Blood pressure                   | 138/79       | 134/73        | 132/71       | 137/75        |
| <140/90, %                       | 50%          | 58%           | 63%          | 53%           |
| ACEI, %                          | 45%          | 68%           | 74%          | 62%           |
| ARB, %                           | 12%          | 11%           | 1%           | 21%           |
| Aldo antagonist, %               | 9%           | 19%           | 20%          | 18%           |
| ( $\alpha$ ) $\beta$ -blocker, % | 33%          | 63%           | 77%          | 46%           |
| Thiazide, %                      | 44%          | 37%           | 37%          | 37%           |
| Loop, %                          | 14%          | 71%           | 78%          | 63%           |
| Spironolactone (S), %            | 3%           | 16%           | 18%          | 14%           |
| CCB, %                           | 39%          | 55%           | 58%          | 51%           |
| Hyperlipidemia                   | 54%          | 62%           | 71%          | 51%           |
| 'Statin'                         | 33%          | 48%           | 60%          | 35%           |
| LDL <100 mg/dL                   | 31%          | 40%           | 44%          | 35%           |
| Diabetes (D)                     | 31%          | 50%           | 53%          | 47%           |
| HbA1c <7% in D                   | 44%          | 44%           | 49%          | 39%           |

ACEI, angiotensin receptor blockers (ARB), aldosterone antagonists (AA), and ( $\alpha$ ) $\beta$ -blockers. We reviewed our primary care database of 70,264 HT patients and identified 5703 with a clinical diagnosis of HF (8%). Findings are summarized in the Table for all HT and all HF patients and for HF patients treated at VA and non-(n)VA primary care clinics. HT patients with HF are older and more likely to have hyperlipidemia and diabetes than all HT, and they are more likely to receive ACEI, AA, and ( $\alpha$ ) $\beta$ -blockers (all  $p < 0.001$ ). The greater use of these meds as well as loop diuretics, spironolactone, and CCBs (all  $p < 0.001$ ) may contribute to higher rates of BP control in HF than non-HF patients, despite their advanced age. HF patients at the VA were more likely to receive ACEI and less likely to receive ARBs than nVA HF patients ( $p < 0.001$ ), which likely reflects formulary restrictions. HF patients at the VA were also more likely to receive ( $\alpha$ ) $\beta$ -blockers and statins than nVA HF patients ( $p < 0.001$ ), which may reflect differences in prescribing patterns and/or better access to these medications at the VA. Primary care providers are more aggressive in treating HT and comorbid risk factors in patients with than without HF. There are several similarities but also striking differences between treatment of HT patients with HF at VA and nVA settings that could favor better outcomes (more [ $\alpha$ ] $\beta$ -blockers, statins, better LDL, HbA1c) for HF patients at the VA.

Key Words: Hypertensive, Heart Failure, Pharmacologic Treatment Patterns

### P-138

#### EFFECT OF BENAZEPRIL AMLODIPINE COMBINATION ON LEFT VENTRICULAR HYPERTROPHY IN HYPERTENSIVE TYPE 2 DIABETIC PATIENTS

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**Aim:** to compare the effects of benazepril and amlodipine alone or in combination on left ventricular mass index (LVMI) in hypertensive diabetic patients with left ventricular hypertrophy (LVH).

**Methods:** a total of 114 mild hypertensive (DBP > 85 mmHg < 100 mmHg) non albuminuric type 2 diabetic patients with LVH (LVMI > 131 g/m<sup>2</sup> in men and > 100 g/m<sup>2</sup> in woman) after a 4 week wash out period were treated with amlodipine 5 to 15 mg od (n = 38) or with benazepril 5 to 15 mg od (n = 38) or with benazepril amlodipine combination 5/5 to 15/15 mg od (n = 38) for 12 months. The aim was to achieve a DBP < 85 mmHg. The patients non responder or complaining side effects at the third month of titration were discontinued. A total of 31 benazepril, 31 amlodipine and 37 combination treated patients completed the study. Echocardiographic evaluation was performed at the end of the wash-out period and after 6 and 12 months of active treatment.

**Results:** patients of the three groups were similar with regard to the duration of diabetes, hypertension, SBP and DBP at rest, degree of LVH and metabolic control. After 12 months the 3 treatments were equally effective in reducing BP (amlodipine : from 154±10/93±5 to 138±9/81±4 mmHg; benazepril: from 153±10/92±5 to 139±9/81±5 mmHg; combination : from 155±11/93±6 to 137±9/81±4 mmHg) but not in reversing LVH because it decreased significantly more in the combination group (-25.1±5 g/m<sup>2</sup> p < 0.001) than in the amlodipine group (-19.9±3 g/m<sup>2</sup> p < 0.01) and in the benazepril group (-9.8±4 g/m<sup>2</sup> p < 0.05). At the intermediate control (6 months) LVMI was significantly reduced in the combination (p < 0.05) and in the amlodipine (p < 0.05) group, but not in the benazepril group.

**Conclusions:** these results show that in the hypertensive type 2 diabetic patients both amlodipine and benazepril are effective in reducing LVMI, however amlodipine leads to a greater and earlier improvement in LVH. The combination induces a greater response than the single drugs; it suggests that in this type of patients calcium channel blockers play a key role for reversing LVH and consequently they seem represent the drugs of choice to be combined with ACE-inhibitors.

Key Words: Diabetes, Amlodipine, Amlodipine Benazepril Combination

### P-139

#### DIETARY FAT TYPE MODULATES ANGIOTENSIN II-INDUCED EARLY LEFT VENTRICULAR HYPERTROPHIC RESPONSES IN RATS

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Long-term dietary intake of fatty acids alters the development of left ventricular hypertrophy. However, the role and signaling mechanisms of diet in the early phase of hypertrophic process are not known. In this study, rats were assigned for 4 weeks of diet supplemented with saturated fat or polyunsaturated oil, or standard diet. Afterwards, rats were subjected to sham operation or angiotensin II infusions (Ang II, 33 µg/kg/hour, sc) for 24 hours. Ang II significantly increased left ventricular weights and mRNA expression of hypertrophy markers ANP, BNP and skeletal  $\alpha$ -actin and cellular oncogene c-fos ( $P < 0.01$ ). As assessed by RT-PCR analysis, Ang II decreased left ventricular inducible nitric oxide synthase (iNOS) mRNA levels, while endothelial nitric oxide synthase (eNOS) mRNA levels remained unchanged. Fat-rich diet augmented the activation of left ventricular c-fos mRNA expression (+120%,  $P < 0.05$ ), whereas attenuated the increase in mRNA levels of growth-inhibitory factors ANP and BNP in response to Ang II (-27% and -20%, respectively,  $P < 0.05$ ). Furthermore, fat-rich diet markedly increased baseline iNOS and eNOS mRNA levels ( $P < 0.05$ ). In contrast, oil-rich diet attenuated Ang II-induced increase in skeletal  $\alpha$ -actin mRNA levels (-31%,  $P < 0.01$ ). Western blot analysis revealed that Ang II markedly induced phosphorylation of downstream effector MAP kinase stress-activated kinase p38 in rats fed fat-rich diet (+180%,  $P < 0.01$ ). Oil-rich diet increased left ventricular Jun N-terminal kinase (JNK) phosphorylation, whereas decreased extracellular signal-regulated kinase (ERK) phosphorylation. Using electrophoretic mobility shift assay, we found that oil-rich diet caused a higher AP-1 DNA binding activity in response to Ang II as compared with fat-rich or standard diets (+80%,  $P < 0.001$ ). These results provide the first evidence that dietary fat type modulates hypertrophic gene program via MAP kinase and AP-1 signaling pathways in the rat heart.

Key Words: Hypertrophy, Fatty Acids, angiotensin