P-611
AMBULATORY BLOOD PRESSURE DURING PREGNANCY: STANDARDS OF NORMALCY; EARLY SCREENING OF PREECLAMPSIA

Aims: To compare BP values measured by ABPM with those of isolated office BP, to establish a BP standard of normalcy at each of the three trimesters of pregnancy, and to examine and compare characteristics of circadian variability in the BP of clinically healthy pregnant women with those of women with chronic hypertension or preeclampsia.

Methods: First trimester pregnant women underwent one 24-h ABPM at each trimester; mean BP values were calculated. Sleep hypertension was defined from previously published studies.

Results: 24-h ABPM was undertaken in 48 women, with a mean age of 32.2±5.1 years, 36 (75%) had chronic hypertension, 21% a history of preeclampsia on previous pregnancies and 23% were previously healthy. 10 women (20.8%) developed preeclampsia.

Comparing isolated office BP values with those measured by ABPM (gold standard) we got the following results: sensitivity 83.3%, specificity 78.9%, positive predictive value (PPV) 35.7%, negative predictive value (NPV) 97.1%.

Regarding uncomplicated pregnancies in healthy women, we got the patterns of ambulatory BP: in this study, unlike other reports where both SP and DP gradually return to nonpregnant levels, DP and nighttime SP tend to stay stable.

As compared to uncomplicated pregnancies in healthy women, a statistically significant elevation of the circadian rhythm-adjusted mean of blood pressure is found in pregnancies with preeclampsia in all trimesters (p<0.001) for both systolic and diastolic BP. Regarding sleep hypertension we got the results described on table I

Positive isolated office BP measures should always be confirmed with ABPM. Normal office BP values are most probably correct.

Regarding uncomplicated pregnancies in healthy women, BP patterns do not match previous studies and will be reanalysed with a larger population.

There is an elevation of the mean BP values in the PE group which is statistically significant through all the trimesters. If we compare the PE group to healthy + CCH group, BP elevation is only significant in the 1st trimester. There is a high prevalence of sleep hypertension in women with preeclampsia or CCH, with a greater frequency of adverse pregnancy outcomes.

Key Words: Preeclampsia, Ambulatory blood pressure monitoring, Hypertension

P-612
SAMPLING REQUIREMENTS FOR THE TOLERANCE-HYPERBARIC TEST IN THE DIAGNOSIS OF HYPERTENSION IN PREGNANCY
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We have previously shown prospectively that the tolerance-hyperbaric test provides high sensitivity and specificity in the identification of pregnant women who will develop hypertension in pregnancy. This approach is based on the use of tolerance intervals as reference threshold for the circadian variability of blood pressure (BP), and the hyperbaric index (HBI, area of BP above the upper limit of the interval) as a measurement of BP excess. We have examined the impact of duration and frequency of BP sampling in the reproducibility of this test. We analyzed 2430 BP series obtained from 25 normalotensive pregnant women and 168 women who developed gestational hypertension or preeclampsia. BP was measured at 20-min intervals during the day (07:00 to 23:00 hours) and at 30-min intervals at night for 48 consecutive hours once every 4 weeks from the first obstetric visit (mostly before 14 weeks of gestation) until delivery. BP series were decimated to generate shorter series with data sampled at 1, 2, 3, or 4-hour intervals for 48 hours, as well as at the original rate for just the first 24 hours. Due to the poor sensitivity of the nocturnal BP mean in pregnancy, we also tested the HBI calculated from diurnal BP values. Sensitivity and specificity of the HBI were similar for the values calculated from the original series and those obtained from shorter series up to data obtained at 2-hour intervals. Specificity, however, was highly reduced when diagnosis was based on data sampled at 20-30 minute intervals for the first 24 hours, while the HBI was poorly estimated (mean error about twice the HBI value needed for diagnosis). Sensitivity was above 89% with specificity above 96% after the 14th week of gestation when the HBI was obtained from data sampled during diurnal active hours every 2 hours for 2 consecutive days. This study on women systematically studied by ambulatory monitoring throughout gestation indicates that sampling for 24 hours is insufficient for a proper diagnosis of hypertension in pregnancy. Moreover, the sampling rate can be greatly reduced by expanding the monitoring span to at least 2 consecutive days. High sensitivity for the diurnal HBI from data sampled every 2 hours suggest the potential cost-effectiveness of self-measurement for screening in pregnancy, an issue that deserves further investigation.

Key Words: Hyperbaric index, Ambulatory blood pressure monitoring, Preeclampsia

P-613
ESTROGEN REPLACEMENT IN POSTMENOPAUSAL WOMEN ACTIVATES THE RENIN-ANGIOTENSIN SYSTEM AT REST AND DURING SIMULATED ORTHOSTATIC STRESS BUT LOWERS BLOOD PRESSURE
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Menopause is associated with activation of the tissue renin-angiotensin system (RAS) through upregulation of both angiotensin converting enzyme (ACE) activity and angiotensin II (Ang II) type 1 receptor expression. Estrogen replacement therapy (ERT) is known to increase circulating angiotensinogen and Ang II in resting conditions but end-organ responsiveness to this humoral activation is not well characterized. The aim of this study in postmenopausal women (PMP) was to determine the blood pressure (BP) and RAS responses to 1 month of ERT both at rest and during stimulation of the RAS by graded lower body negative pressure (LBNP).

In 13 normotensive (BP<140/90) PMP women (54±2yrs)(mean±SE), supine BP, heart rate (HR), renin, angiotensinogen, plasma renin activity (PRA), Ang II and aldosterone were measured at rest, during incremental LBNP (-10, -20 and -40 mmHg) and 15 mins afterwards. All measurements were repeated after 4 weeks of estradiol 2 mg daily. Baseline values for PRA (P<0.05), Ang II (P<0.01), and angiotensinogen (P<0.01) were significantly higher but aldosterone and renin were unchanged post-ERT. The increase in these components of the RAS induced by LBNP was significantly greater post-ERT and was further augmented during recovery from LBNP. Despite this increase in Ang II, mean arterial BP was significantly lower at both rest (P<0.05) and during LBNP (P<0.01) when compared to pre-ERT. ERT did not
influence rest HR or reflex HR during LBNP. Pre-syncope during -40 mmHg LBNP was twice as common post-ERT (4vS). Despite an increase in circulating RAS following oral ERT there is no increase in aldosterone, a reduction in resting BP and diminished capacity to defend BP during simulated orthostatic stress. These results suggest that ERT may protect against activation of the RAS by down-regulating tissue responsiveness to Ang II either directly at the receptor level or alternatively by modifying counterregulatory hypotensive mechanisms. In pathological states such as hypertension and congestive cardiac failure, this attenuation by ERT may protect this high risk population against the potentially deleterious effects of Ang II.

Key Words: estrogen, renin-angiotensin system, menopause

P-614
EXAGGERATED BLOOD PRESSURE RESPONSE TO EXERCISE PREDICTS NEW-ONSET HYPERTENSION IN WOMEN: WOMEN TAKE HEART STUDY, 1992-2001
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Hypertension is highly prevalent condition in the adult population in the United States and an established risk factor for coronary, cerebrovascular and renal disease. Although exaggerated acute systolic blood pressure (SBP) response to exercise has been shown to predict subsequent development of hypertension in small samples of men, only one study has examined this association in a large population based sample of middle-aged women; the result is contradictory to the results found in men. We examined the relationship between exaggerated SBP response to exercise and risk of developing new onset hypertension in a cohort of 1417 normotensive middle-aged women, free of coronary heart disease and diabetes at the baseline examination in 1992. Baseline data included medical and family history, demographic characteristic, measurement of BP, height and weight, and symptom limited treadmill stress test using Bruce protocol. Those who did not enter Bruce stage 2 (n=16) were excluded from the analysis. Exaggerated SBP was defined as age-predicted exercise SBP greater than the 95th percentile value. Mean age ± standard deviation of the cohort was 45±6 years. The multivariate logistic analysis results were:

Multivariate Adjusted Odd Ratio for Exaggerated Acute SBP and Risk of Hypertension

<table>
<thead>
<tr>
<th></th>
<th>Adjusted Odds Ratio</th>
<th>95% Confidence Interval</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years</td>
<td>1.00</td>
<td>0.98-1.03</td>
<td>0.733</td>
</tr>
<tr>
<td>BMI (kg/m2)</td>
<td>1.08</td>
<td>1.06-1.11</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Resting SBP</td>
<td>1.06</td>
<td>1.04-1.07</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Exercise time in minutes</td>
<td>0.99</td>
<td>0.93-1.05</td>
<td>0.761</td>
</tr>
<tr>
<td>Exaggerated SBP</td>
<td>1.57</td>
<td>1.17-2.11</td>
<td>0.003</td>
</tr>
</tbody>
</table>

These results suggests a significant association between exaggerated SBP response to exercise and risk of new-onset hypertension in middle aged women. The etiologic factors that contribute to this needs to be explored.

Key Words: Hypertension, Exercise treadmill, Women

P-615
THE ROLE OF GLUCOZIDED HAEMOGLOBULIN IN THE AMBULATORY BLOOD PRESSURE OF HYPERTENSIVE WOMEN
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Aim: The purpose of this study was to elucidate the association between glucozided haemoglobin serum levels (HbA1c) and the levels of 24 hours monitoring blood pressure of premenopause and menopause hypertensive women.

Methods: We studied 20 women with essential hypertension without any treatment (12 menopause women [medium AGE = 60.16±5.1 years old, [medium] SDBP=152.8±96.7±17±11.5 mmhg and 8 premenopause women [medium] age=39.5±12 years old, [medium] SDBP=144.8±909.8±7.1/2.3 mmhg). We measured serum HbA1c of the subjects and a 24 hours recording of blood pressure was achieved.

Results: There was a significant correlation between HbA1c and office SBP (r=0.512 p=0.05), night SBP (r=0.580 p=0.048), as well as with 24 hours systolic blood pressure load: SBP24H (r=0.615 p=0.044) in menopause hypertensive women and a significant correlation between HbA1c and office DBP (r=0.825 p=0.001) day DBP (r=-0.901 p=0.0060, [medium] 24 DBP (r=-0.953 p=0.001), [medium] office BP (r=0.807 p=0.001) in premenopause hypertensive women.

Conclusions: HbA1c is significantly correlated with hypertensive status of women and particular in premenopause hypertensive women, suggesting the relationship between glucose and blood pressure.

Key Words: Glucozided Haemoglobin, Hypertensive Women

P-616
EFFECT OF DIET AND PHYSICAL EXERCISE ON CARDIOVASCULAR RISK FACTORS IN WOMEN: MENOPAUSE VERSUS FERTILE AGE
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The aim of the study was to identify the effect of hypocaloric diet and aerobic exercise on several cardiovascular risk factors in women before and after menopause.

This study was performed in two groups of obese (BMI>27Kg/m2) women (n=42); women in fertile age (n=22) and in menopause (n=20). Implementation of aerobic exercise (40 minutes, 3 times per week) and hypocaloric diet were evaluated before and after lifestyle modifications. Blood samples collected in the same periods were used to evaluate total cholesterol, HDL-C, apolipoprotein B and homocysteine. Mean follow up: 12±1 months.

Effect of Diet and Regular Exercise Before and After Protocol

<table>
<thead>
<tr>
<th></th>
<th>Fertile Before</th>
<th>Fertile After</th>
<th>Menopause Before</th>
<th>Menopause After</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>30.3 ± 2.3</td>
<td>28.5 ± 2.4</td>
<td>32.6 ± 2.2</td>
<td>30.4 ± 2.3</td>
</tr>
<tr>
<td>Waist circumference</td>
<td>87.5 ± 5.0</td>
<td>83.3 ± 5.2</td>
<td>97.8 ± 5.6</td>
<td>93.1 ± 5.2</td>
</tr>
<tr>
<td>Systolic blood pressure</td>
<td>131.7 ± 10.3</td>
<td>127.5 ± 13.2</td>
<td>131.8 ± 10.7</td>
<td>126.0 ± 10.9</td>
</tr>
<tr>
<td>Diastolic blood pressure</td>
<td>75.5 ± 10.6</td>
<td>70.7 ± 10.9</td>
<td>69.9 ± 10.1</td>
<td>68.1 ± 10.1</td>
</tr>
<tr>
<td>F. cholesterol</td>
<td>198.7 ± 16.0</td>
<td>186.2 ± 16.2</td>
<td>244.2 ± 15.1</td>
<td>226.0 ± 16.6</td>
</tr>
<tr>
<td>HDL-C</td>
<td>3.8 ± 0.4</td>
<td>3.7 ± 0.2</td>
<td>4.2 ± 0.1</td>
<td>3.5 ± 0.6</td>
</tr>
</tbody>
</table>

Key Words: Hypertensive Women