**Relationship of Glutathione Peroxidase activity (GPx) to Sex-specific Differences in Vascular Stiffness and Central Obesity in Patients with Type 2 Diabetes**

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**Abstract:**
Vascular stiffness is an emerging risk factor for cardiovascular disease which we previously reported to be associated with central obesity in women. We hypothesized that GPx activity would be affected differently by oxidative loads from visceral fat according to gender. We studied a cohort of 171 patients with T2DM with characteristics in table 1 below. A vascular stiffness index (SI) was computed using infra-red finger plethysmography. Total body fat was assessed using bio-impedance and eGFR from the CKD-EPI equation.

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|  | **Females (n= 85)** | **Males (n = 86)**  | **p-value** |
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| **Caucasian (%)** | 33 | 49 |  |
| **Age (years)** | **61.58 [6.96]** | **59.87 [8.31]** | 0.148 |
| **Waist Circumference (cm)**  | **101.37 [14.02]** | **102.84 [11.72]** | 0.464 |
| **Body Mass Index (kg/m2)** | **31.02 [6.9]** | **29.87 [4.88]** | 0.208 |
| **Sitting Systolic Blood Pressure (mmHg)** | **138.77 [17.11]** | **141.30 [15.36]** | 0.313 |
| **Duaration of Diabetes (years)** | **9.46 [6.70]** | **11.06 [8.04]** | 0.186 |
| **HbA1c (mmol/mol)** | **59.38 [18.43]** | **55.89 [18.26]** | 0.219 |
| **eGFR - CKD EPI (mls/min/1.73m2)** | **89.98 [16.24]** | **88.76 [17.95]** | 0.642 |
| **Bio-impedence (%)**  | **40.44 [8.02]** | **28.99 [7.63]** | 0.000 |
| **Vascular Stiffness Index (m/sec)** | **9.12 [6.66]** | **9.99 [4.55]** | 0.337 |

Vitamin E, selenium and the activity of plasma GPx were assessed as markers of anti-oxidant defense. GPx activity was significantly higher in women vs men (382.75 [99.8] vs 343.37[128.01], p-value 0.029) but Vit.E and Selenium levels were similar (8.76 [2.54] vs 8.95 [3.03], p-value 0.664 and 1.27 [0.23] vs 1.25 [0.28], p-value 0.583 respectively).
A linear regression analysis with SI as the dependant variable in women showed a relationship with waist circumference (0.150; p = 0.008) and with eGFR ( - 0.150; p 0.006), but not with GPx. In non-Caucasian men we found a significant positive relationship with GPx (0.02; p = 0.007) and Vit E (0.670; p = 0.69) with SI.
Low GPx activity in these men is associated with increased SI where in women higher levels could be linked to greater oxidative stress loads in relation to central obesity.
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Author Disclosure Information:

 **M. Steyn:** None. **K. Zitouni:** None. **F. Kelly:** None. **K.A. Earle:** None.
**Category (Complete)**:  02-A Complications–Macrovascular–Atherosclerotic Cardiovascular Disease and Human Diabetes
**Presentation Preference (Complete)**:  Oral Preferred

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