

Your reference	Our reference	date
		17-07-2009
Contact person	e-mail	tel. and fax
	patrick.segers@UGent.be	T +32 9 332 3466 F +32 9 332 4159

Concerns:

PhD Jitka Seidlerova Kucerova – Report

"Interactive influences of environmental and genetic factors on the properties of large arteries in relation to sodium handling"

General comments

This PhD thesis is of a very high quality. The text is very well written and has a clear structure. Data have been analyzed in depth with, as far as I can judge, most appropriate statistical approach. Discussions are to-the-point and conclusions are clear with attention for potential limitations. Most chapters have been published in high-ranked peer-reviewed journals in the domain of Hypertension research. I only have a few comments mainly related to the introduction chapter. The candidate can be given unconditional permission for the public defense.

Major comments

- (i) Why did you not (also) use the carotid tonometry recordings to assess central AIx
- (ii) How did you calibrate the radial, carotid and femoral tonometer waveforms to assess local PP ? This should be added to the intro section.

Minor comments

- Page 3: I would suggest to retitile section 1.1.1 as Pulse Wave Velocity is not really discussed in this section.
- Page 4-5: a decrease in distensibility/compliance does not automatically lead to an increase in systolic blood pressure. It is only through a concomittant increase in resistance that systolic blood pressure rises (see eg. Elzinga and Westerhof, Circ Res 1973; Segers et al., Hypertension 2000)
- 1.1.2, line 3: replace "exerted" by "induced"
- Top of page 5 "distensibility is a determinant of the pulsatile stress on the vessel wall": I would rephrase this section. The distension of the vessel is a kinematic property, rather than a mechanical

one. The distension (strain) of the vessel is linked with the stresses in the material via its material properties (the constitutive equation). As it is written now, I would interpret this paragraph as having a high distensibility being a bad feature.

- Section 1.1.3: I suggest to give the Bramwell-Hill formula linking PWV to the distensibility coefficient.
- page 6, 5th line from below: outside THE aortic tract
- page 7, 12th line from below: as THE ratio
- page 11, line 2: add references to support this statement
- page 11, line 3: PP and Alx are dependent on the speed of both the forward and reflected wave
- page 11, 5-3rd line from below: I don't think it is correct that smaller body size favours higher systolic pressures. Reason is that also the heart rate is higher in smaller subjects (see e.g. Westerhof N., *Cardioscience* 1994).
- page 12, 2nd line from below: "aPWV" instead of "a PWV"
- p19, line 2: THE effect
- p23: Chapter 4, based on THE ...
- p37, bottom: I don't think the definition of Alx is correct (also in subsequent sections). When expressing it as the ratio of (difference in P1 and P2) and PP, the value is always lower than 100%, which is not the case. I think it is expressed as the ratio of P2 to P1 or as $(P2-DBP)/(P1-DBP)$. Please verify.
- p38: what was the distance used in aPWV ? Direct carotid-femoral or a corrected distance ?
- p43, top panel: y-axis should be DeltaPP
- p44,45: what is the "systolic" augmentation index ?

Sincerely,

prof. dr. ir. Patrick Segers

Gent, July 17, 2009