Application of dobutamine stress tissue Doppler echocardiography for detection of myocardial ischemia in comparison to coronary angiography

Thesis Submitted by

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For Partial Fulfillment Of
MD Degree in Critical Care Medicine

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Abstract

Introduction:

One of the main limitations of dobutamine stress echo (DSE) is the subjective nature of visual interpretation. One of the most important fields of the supposed application of tissue Doppler Imaging (TDI) is the objective evaluation of myocardial contraction.

Aim of work:

To investigate whether the quantitative information obtained from using TD velocities during DSE would help in the detection of myocardial ischemia and viability or not.

Patients and methods:

٦٠ patients with known or suspected to coronary artery disease (CAD) subjected to elective diagnostic coronary angiography (CA) included. Patients were divided into two groups: ***Group I:*** (١٥ pts have coronary artery stenosis ≥ ٥٠% with normal EF and absence of resting wall motion abnormality (WMA). ***Group II***: (٢٥ pts have coronary artery stenosis ≥ ٥٠% and EF <٤٥% with resting WMA; *(ischaemic cardiomyopathy)*. ٢٠ patients with normal CA and normal echo were used as ***control group (normal group)***.

Results:

At rest: S: no statistical significant difference between *ischaemic* segments in group I and *normal segments* in control group (٧.٨٩±١.٤ *cm/secvs*٨.٩٩±٢*cm/sec, respectively*, *P: NS)*. E' statistically lower in *ischaemic* segments of group I compared to *normal segments* in control group (٨.٧٢±٢.١ *cm/secvs* ١١.٨٣±٣.٢*cm/sec, respectively, P*<٠.٠٥*)*. ***Group II:*** the reduction was more prominent in *akinetic segments* than *hypokinetic segments(S:* ٣.٠١±٠.٩*vs* ٥.٤٤±١.٤*, respectively& E':*٣.٩٥±١.٢ *cm/sec vs* ٦.٥٠±٢.٢ *cm/sec, respectively) (P* < ٠.٠٥).

With stress: S and E': statistically lower in *ischaemic segments* of group I compared to *normal segments* of control group *(S:* ١٥.٣٨±٢.٤*cm/sec vs* ٢٣.٤٨±٤.٤*cm/sec,& E':* ١٥.٢±٣.٧*cm/sec vs* ٢٣.٢٧±٤.٩*cm/sec, respectively, P*<٠.٠٥*)*. ***Group II:*** S and E' velocities were statistically higher in *hibernating segments* than *non viable segments* at LDD *(S:* ٩.٧٤±٢.٣*cm/sec vs* ٣.٠٥±٠.٩*cm/sec respectively& E':* ١٠.٦±٢.٧*cm/sec vs* ٤.٠٥±١.٩ *cm/sec respectively)* (P<٠.٠٥).Regarding A' there was no statistical difference between different groups. Cut-off values for detection of ischaemia were the increase from rest to peak stress in S ≤ ١١٥% and E' ≤ ١٠٤% with ٨٣ %, ٧٩% sensitivity and ٨٤%, ٧٩% specificity respectively and for viability were an increase of ٢.٩ cm/s in S and ١.٥ in E' during LDDSE with (sensitivity ٩٠% and ٩٦% &specificity ٨٧% and ٩٧%; respectively).

Conclusion:

TDI provided quantitative information for detection of myocardial ischaemia and myocardial viability

Key words:

DSE, tissue Doppler, coronary angiography