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PR prolongation strongly predicts new-onset myocardial infarction, ischaemic stroke, heart failure, and cardiovascular death in coronary patients or risk equivalent: a 5-year clinical-pathophysiological study

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Objectives: To investigate the role of PR prolongation in new-onset adverse cardiovascular (CV) events in high-risk CV patients, and the underlying pathophysiological mechanisms in terms of vascular phenotypes.

Methods: We prospectively followed up 597 high-risk CV out-patients (mean age 66±11 years; male 67%; coronary disease 55%, stroke 22%, diabetes 52%) for new-onset ischaemic stroke, myocardial infarction (MI), congestive heart failure (CHF), and CV death. Vascular phenotypes were assessed by high-resolution ultrasound for mean carotid intima-media thickness (IMT), and Vascular Profiling System (VP-2000; subgroup n=338) for pulse wave velocity (PWV). Impaired left ventricular ejection fraction (LVEF) from transthoracic echocardiography (subgroup, n=194) was defined as <35%. PR interval was determined from 12-lead electrocardiogram.

Results: PR prolongation >200 ms was present in 79 (13%) patients at baseline, and was associated with a higher mean carotid IMT (1.05±0.37 mm vs 0.94±0.28 mm, P=0.010), higher PWV (1144±142 cm/s vs 1091±143 cm/s, P=0.024), and impaired LVEF of <35% (16% vs 5%, P=0.027). Adjusted for potential confounders, PR prolongation was independently associated with increased carotid IMT by +0.073 mm (95% confidence interval [CI]: 0.003-0.143, P=0.041). After a mean follow-up of 63±11 months, increased PR interval significantly predicted new-onset ischaemic stroke (P=0.006), CHF (P=0.040), CV death (P<0.001), and combined CV endpoints (P<0.001) at cut-off >200 ms, and new-onset MI at >162 ms (P=0.008) [C-statistic 0.70, P=0.001], with K-M analyses showing significantly reduced event-free survival (all P<0.05). Adjusting for potential confounders by multivariable cox regression, PR prolongation independently predicted increased risk of new-onset ischaemic stroke (hazard ratio [HR]=5.1, 95% CI: 1.3-19.1, P=0.017), CV death (HR=16.4, 95% CI: 4.0-67.5, P<0.001), combined CV endpoints (HR=2.3, 95% CI: 1.3-4.3, P=0.007) at cut-off >200 ms, and increased new-onset MI (HR=8.1, 95% CI: 1.7-39.1, P=0.010) at cut-off >162 ms.

Conclusions: PR prolongation of >200 ms strongly predicts new-onset ischaemic stroke, MI, and CV death, and combined CV endpoint including CHF in high-risk CV patients. Increased risk of MI was observed at >162 ms. Abnormal vascular function may represent intermediate phenotypes or a mediating mechanism to clinical events.

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First year of 24/7 Acute Stroke Unit. Part 2: Outcome of stroke thrombolysis using telemedicine

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Objective: To evaluate the safety and efficacy of intravenous recombinant tissue plasminogen activator (IV-rtPA) for acute ischaemic stroke through telemedicine consultation.

Methods: Records of stroke patients treated with IV-rtPA over the first 12 months of 24/7 thrombolytic service were reviewed. Outcomes of patients treated outside and during office hours, with the former through telemedicine consultation, were compared.

Results: Of the 45 patients given IV-rtPA, 25 (55.6%) cases were treated during non-office hours and 20 (44.4%) cases during office hours by the on-site neurologists, with mean door-to-needle time of 102 minutes in the former and 98 minutes in the latter (P=0.64). The number of symptomatic intracranial haemorrhage and other complications in each group of patients was 3 or 4 (12% and 20%, P=0.68), respectively. Median modified-Rankin score (mRS) was 3 in patients treated during non-office hours with 28% achieving functional independence. There was no significant difference as compared to those treated during office hours (median mRS=3.5, P=0.3; proportion achieving functional independence=45%, P=0.35). The mortality rates in the two groups were 20% and 10% (P=0.44), respectively.

Conclusion: Rapidity, safety, and outcome of IV-rtPA patients treated after office hours through telemedicine consultation are comparable to those managed during office hours by an on-site neurologist. Our data support that the current 24/7 IV-rtPA protocol is a feasible model for the effective administration of thrombolytic therapy to acute stroke patients.