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Intramyocardial bone marrow mononuclear cell injection in patients with ischemic heart disease: a safety evaluation of 333 procedures

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Background: Cardiac cell therapy has been introduced as a novel treatment option for ischemic heart disease patients. Previously, we demonstrated in a RCT that intramyocardial bone marrow mononuclear cell (BMC) injection improves myocardial perfusion in no-option patients with refractory angina pectoris (RAP). Since 2010 this procedure is a standardized treatment for refractory angina patients with myocardial ischemia without options for revascularization.

Methods: We assessed 333 patients (age 63±10years, male 88%) who underwent intramyocardial injection of BMC, mesenchymal stromal cells or placebo injection between 2005 and 2017, using the NOGA system. Periprocedural and 1 year follow-up adverse events were noted. Major events were defined as an additional intervention or a prolonged hospitalisation.

Results: The patients treated for RAP showed improved Canadian Cardiovascular Society score from 3.1 ± 0.6 at baseline to 2.2 ± 0.7 at 3 months (P<0.001) whereas quality-of-life improved by22% (P<0.001). There were no fatalities as a result of the procedure. Indication for injection was RAP (n=289), ischemic heart failure (n=35), acute myocardial infarction (n=9). In 39 patients (11.7%) a procedural complication occurred. Of which 43,6% was defined as major event. Those existed of 3 patients with a stroke; 1 during the procedure, 1 several hours after the procedure and 1 patient had a transient ischemic attack. Six patients had a spurious aneurysm needing an intervention. Two patients had a periprocedural myocardial infarction and 2 had an asthma cardiale. One patient had pericardial effusion requiring pericardiocentesis, 1 had a ventricular tachycardia followed by electric cardioversion and 1 patient had an abdominal aortic dissection. In 4 patients the cell material was aggregated and couldn't be used. During 1 year follow-up no additional adverse events were observed.

Table 1

| Indication cell therapy | Complication, n (%) | Major, n (%) / Minor, n (%) |
|---|-------------------------|--|
| Refractory angina pectoris (n=289) Ischemic heart failure (n=35) | 33 (11,4%) 4 (11,4%) | 15 (45,5%) / 18 (54,5%) 1 (25%) / 3 (75%) |
| Acute myocardial infarction (n=9) | 2 (22%) | 1 (50%) / 1 (50%) |

Conclusion: Intramyocardial cell injection is relatively save, and associated with sustained improvements of anginal complaints in no-option refractory angina patients

ENVIRONMENTAL AND GLOBAL IMPACTS ON BLOOD PRESSURE

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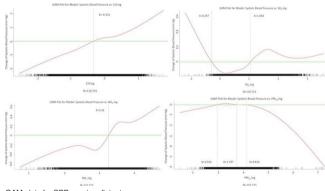
Short-term exposure to ambient air pollutants affected home blood pressure in patients with chronic cardiovascular diseases

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Background: Many studies investigated the association between exposure to ambient air pollutants and blood pressure, but the results were inconsistent. **Purpose:** We aimed to investigate the relationship between short-term ambient air pollution exposure and home blood pressure (HBP) in patients with chronic cardiovascular diseases.

Methods: A total of 253 patients who had joined a telehealth care program in a university-affiliated hospital from 2009 to 2013 were enrolled in this retrospective study. Blood pressure was measured at home and data were instantaneously transmitted to the server of the hospital for storage and analysis. Demographic and clinical details were collected. Hourly meteorological and ambient air pollution monitoring data during the same time period were obtained from the government. Marginal regression models using the generalized estimating equations (GEE) method were adopted.

Results: A total of 110,715 HBP measurements were collected from 253 patients during the study period. In multivariate analysis, some demographic (age, gender), clinical (underlying diseases) and meteorological (ambient temperature, relative humidity and wind speed) factors significantly affected home blood pressure. Some air pollutants, such as carbon monoxide (CO), sulfur dioxide (SO2), nitrogen dioxide (NO2), and particulate matter with a diameter between 2.5 and 10 micrometers (μ m) (PM10) would also significantly affect home blood pressure. Short-term exposure to particulate matter 2.5 (PM2.5), though, didn't significantly affect home blood pressure.



GAM plots for SBP vs. air pollutants

Conclusions: Short-term exposure to some ambient air pollutants affected home blood pressure in patients with chronic cardiovascular diseases. **Funding Acknowledgements:** Research grant from National Taiwan University Hospital.

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Evaluation the relationship between arterial hypertension and ionizing radiation as a result of the Chornobyl accident in the remote post-accidental period

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Background: Various epidemiological findings have raised awareness of possible cardiovascular risk following exposure to radiation. It is necessary to study the development of different cardiovascular disease, such as arterial hypertension, in affected population in remote post-accidental period to develop scientifically based criteria due to ionizing radiation and other hazards of the Chornobyl disaster.

Purpose: The purpose of the study was to evaluate the relationship between arterial hypertension and ionizing radiation as a result of the Chornobyl accident thirty years after Chornobyl accident.

Methods: From a database we identified clean-up workers with arterial hypertension who undergo expertise to establish causation of disease, disability and