Gender differences in rehabilitation outcomes among older Chinese patients

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Introduction: At present, male and female patients undergo the same programme in geriatric rehabilitation. During literature review, we cannot find any study concerning whether there are gender differences in geriatric rehabilitation. This study investigated the relationship between gender and rehabilitation outcomes of older Chinese patients.

Methods: It was a retrospective study carried out in two geriatric rehabilitation hospitals in Hong Kong. Absolute functional and motor gains were expressed as Barthel Index (BI) efficacy and Elderly Mobility Scale (EMS) efficacy. BI and EMS efficiency were efficacy divided by the length of stay. Satisfactory motor and functional outcomes were defined as discharge EMS ≥15 and BI ≥75.

Results: A total of 1795 patients were studied. Compared with men, women had higher BI but lower EMS on admission and discharge. EMS and BI efficacy and efficiency were similar in both sexes. Female gender was a significant independent negative predictor for satisfactory motor outcome (P=0.0002) but a positive predictor for functional outcome (P=0.0007). Other independent predictors for satisfactory motor outcome were: age (P<0.001); urinary incontinence (P=0.0049); living at home (P=0.0056); admission EMS (P<0.001); admission BI (P=0.044). Other predictors for satisfactory functional outcome were: age (P=0.009); infection other than chest (P=0.047); urinary incontinence (P<0.001); Mini-Mental State Examination (P=0.0004); admission EMS (P=0.005); BI (P<0.001).

Conclusion: Women achieved a better functional outcome but a poorer motor outcome on discharge. Female gender was a positive predictor for functional outcome but a negative factor for motor outcome. Our results seem to suggest that a gender-tailored rehabilitation programme is needed to foster the motor and functional independence of older men and women.

Distinctive functions of methionine aminopeptidase II in embryonic haematopoiesis in zebrafish embryos

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Introduction: Methionine aminopeptidase 2 (MetAP-2) is known to be the target of an anti-angiogenesis compound fumagillin and has been investigated for its robust expression in human cancers and its anti-proliferative effects on endothelial cells. Together with a related member MetAP-1, they are proteases which remove the initiator NH2-terminal methionine from the nascent peptides during protein translation. Despite its pathogenetic significance in cancers, the physiological role of MetAP-2, particularly during embryonic development, has remained unclear. In this study, we made use of the zebrafish model and investigated the expression and functions of MetAP-2 during embryonic development, with particular reference to haematopoiesis.

Methods and Results: We injected a morpholino (4.5 ng) targeting at the splice-site junction of MetAP-2 gene into zebrafish embryos at 1-4 cell stage (referred as MetAP-2^{MO} embryos). Molecular targeting was confirmed by real-time polymerase chain reaction (RT-PCR). Modulation of MetAP-2 activity was shown by a shift of isoelectric point of GAPDH in 2-dimensional electrophoresis. The MetAP-2^{MO} embryos exhibited a kinked tail with altered somitic patterning and specific changes in haematopoietic gene expression as shown by both whole-mount in-situ hybridisation and RT-PCR. The latter included down-regulation of *scl* and *lmo2* (primitive HSC) and up-regulation of *mpo* (primitive myeloid cells) at 18 hpf, as well as up-regulation of *c-myb* and *runx1* (definitive HSC) at 36 hpf. Importantly, the haematopoietic phenotype could be rescued by co-injecting the embryos with MetAP-2 mRNA and re-capitulated by treating the embryos with fumagillin and its analogues. Mechanistically, the MetAP-2^{MO} embryos exhibited reduced camodulin kinase II (CaMKII) activity and the haematopoietic phenotypes could be rescued by CaMKII mRNA and recapitulated by a CaMKII inhibitor. Treating the embryos with inhibitors of RhoA and JNK also recapitulated some of the haematopoietic phenotypes. The canonical Wnt pathway, characterised by β-catenin signalling, was not affected.

Conclusion: We demonstrated that MetAP-2 knock-down resulted in down-regulation of *scl* and *lmo2* and up-regulation of *mpo*, *c-myb* and *runx1*. Treating the embryos with a specific MetAP-2 inhibitor fumagillin and its structural analogues recapitulated these changes in haematopoietic gene expression, supporting the proposition that MetAP-2 is involved in the regulation of embryonic haematopoiesis. Mechanistically, the haematopoietic phenotypes were linked to the modulation of non-canonical but not the canonical Wnt pathways. These observations have provided us with important insights to the regulation of embryonic haematopoiesis.