



ELSEVIER

EDITORIAL

## JECM: Moving Forward

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With this issue of the *JECM*, there seems to be a mounting momentum, i.e., valuable contributions from our TMU (Taipei Medical University) family. After all, this is an appropriate example to set for Taiwan and the entire Asia-Pacific region. This international goal has been our aim from the beginning as set forth by President Chiu<sup>1</sup> and in my editorials.<sup>2–4</sup> Now, what makes this issue special: first, there is an abundance of review papers from TMU-affiliated institutions. Second, there is a palpable urgency as embodied in two of the reviews: cancer and stem cells. The other two reviews focus on equally pressing health problems: diabetes and tuberculosis. Let us briefly take a look at these review papers. This is not to ignore the original articles, but there are constraints on space.

The journal's Vice Editor-in-Chief has submitted a review that is very important in the clinical realm. According to Whang-Peng and colleagues, hepatocellular carcinoma (HCC) is one of the most common cancers worldwide as evidenced by approximately 600,000 patients suffering yearly. The highest incidence occurs in Southeastern and Eastern Asia with an incident rate around 18.3–35.5 per 100,000 population. It is lowest in Central America with 2.1 per 100,000 population. Thus, HCC is one of the leading malignancies in Taiwan. Hepatitis B or C virus infections account for the major factors for liver cancer in Taiwan. The survival time for patients with HCC, without therapy after diagnosis, averages 1–4 months. Treatments include liver transplantation, surgery, transcatheter arterial chemoembolization and transcatheter arterial embolization, percutaneous injection or radiofrequency ablation, chemotherapy, hormone therapy, internal radiation therapy, targeted

therapy, combination of chemotherapeutic agents and tyrosine kinase inhibitors, antiangiogenesis therapy, metabolic targets and Chinese herbal medicine.

To assist in diagnosis and treatment, Whang-Peng and her team have devised three essential flow charts. Once diagnosed, it is essential for the HCC high risk patient to be followed by utilizing the *HCC High Risk Group Surveillance Flow Chart 1*. If a mass is suspected, patients are then diagnosed utilizing the *HCC Diagnosis Flow Chart 2*. Upon confirmation of HCC diagnosis, HCC treatment should follow *HCC Treatment Flow Chart 3*. Because the liver itself is the body's detoxification organ, its cells are already numerous with an elevated expression of the MDR gene. This makes chemotherapeutic drug treatment difficult. However, new molecular targeted therapy or new effective drugs show promise for treating this difficult HCC.

The utilization of animal models as applicable to the human condition is relevant to biomedical research. Chen and colleagues have approached the mechanism of oligohydramnios-induced pulmonary hypoplasia using a rat model. Pulmonary hypoplasia is common in the perinatal period and is a significant cause of death in newborn infants, and oligohydramnios is one of the most commonly associated abnormalities. Neonates exposed to oligohydramnios caused by premature rupture of membranes have an increased risk of acute respiratory morbidity. The exact mechanism by which oligohydramnios alters the respiratory system remains unknown. To approach the problem, they examined the effects of experimental oligohydramnios on lung growth and the expressions of growth factors and extracellular matrix in fetal rats on days 19 and 21 of

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gestation. To achieve this, they produced oligohydramnios from gestation days 16 to 21 in Sprague-Dawley dams. Mother rats exposed to oligohydramnios exhibited lung hypoplasia, significantly decreased extracellular matrix, transforming growth factor- $\beta$ 1 and platelet-derived growth factor expressions on gestation days 19 and 21. Concomitant maternal retinoic acid treatment at a dose of 10 mg/kg increased platelet-derived growth factor expression but there was no enhanced fetal lung development. These results suggest that there is a stage-specific requirement for retinoic acid during lung development. Still, retinoic acid treatment should be applied with caution.

No one will doubt the enormous potential of using stem cells to manage, ameliorate, and perhaps even prevent the onset or spread of disease after it is full blown or set in motion. We know that every tissue and organ owe their early embryonic origin to stem cells. With aging and the appearance of multifunctional syndromes, we seek now to overthrow or delay our inevitable demise by finding and harnessing a reproducible and reliable source of stem cells. Well known sources are bone marrow and umbilical cord, which are just two examples. Now, thanks to the ingenuity of Huang and a multidisciplinary team, a most unusual source of stem cells has been identified. They propose dental stem cells and tooth banking for regenerative medicine.

Clearly, they recognize that stem cell therapy has a promising future for tissue regenerative medicine. However, as stem cell technology is in its infancy, interdisciplinary cooperation has been fiercely advocated and is strongly needed to achieve successful clinical applications. Dental stem cells have drawn attention in recent years due to their accessibility, plasticity, and high proliferative ability. Several types of dental-derived stem cells have recently been identified, including dental pulp stem cells (from adult human dental pulp), stem cells from human primary exfoliated deciduous teeth, periodontal ligament stem cells, and dental follicle stem cells from human third molars. Similar to mesenchymal stem cells, these dental stem cells have self-renewal

and multipotent differentiation ability. It is noteworthy that these cells do not seem to be hampered by ethical considerations as is the case for other sources such as those from embryos or fetuses. Thus, appropriate preservation procedures for dental stem cells and teeth have become an urgent need. In this respect, tooth-banking has been proposed as it is clinically feasible and commercially available. There are other considerations and limitations of current cryopreservation techniques for dental stem cells/teeth or tissues.

Hsu and several clinical/basic teams have pooled resources and examined obesity. It is prevalent and is rapidly increasing in all industrialized countries. This is most pronounced in the past few decades and may be due to factors such as dietary and lifestyle changes. Since 1980, the ubiquity of obesity has increased three-fold or higher internationally. Obesity is associated with several diseases and metabolic abnormalities that are often accompanied by high morbidity and mortality. These include type 2 diabetes, hypertension, dyslipidemia, coronary heart disease, gallbladder disease, and certain cancers. Clearly, there is a marked cause-and-effect relationship. Evidence shows that even relatively modest decreases in body weight (5–10% of initial body weight) will lead to marked improvements in blood pressure, as well as sugar and lipid control in obese patients; there is a growing number of individuals who are excellent examples of such success. Obesity treatment should begin with lifestyle modifications that focus on behavioral modifications, diet control, and regular exercise.

## References

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