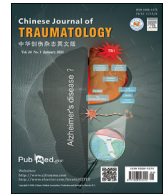


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Review Article

Annual review of Chinese Journal of Traumatology 2020

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ABSTRACT

The year 2020 is an extremely unusual year. The world lost more than one million lives due to the attack of COVID-19. Economic production has been greatly reduced, and daily activities are largely restricted. Luckily the work of Chinese Journal of Traumatology (CJTEE) has not been adversely affected. 2020 is a harvest year for the journal, which (1) was included in the high-quality academic journals by China Association for Science and Technology; (2) cover of each issue is newly designed; (3) submission increased by about 60% with more countries and regions covered; (4) usage in the ScienceDirect database exceeded a million; (5) the CiteScore rises to more than 2.0 the first time. This study reviewed the articles published in the year 2020 by CJTEE.

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Introduction

Chinese Journal of Traumatology (CJTEE) published 72 papers in the year 2020, covering the directions of trauma-related basic research, psychological trauma, traffic injuries, clinical management of vascular trauma, head trauma, chest trauma, and so on. For each issue, a special topic was identified and then corresponding cover was self-designed. The most popular article is that entitled “*The severe COVID-19: A sepsis induced by viral infection? And its immunomodulatory therapy*” composed by Prof. Hong-Yuan Lin from General Hospital of PLA. It was downloaded for more than 3000 times within one month after its publication on August. Here we begin this review with it.

COVID-19 and infection

It was one hundred years after the last global pandemic. Until now there are 62,363,527 confirmed cases and 1,456,687 death of COVID-19, affecting 220 countries, areas or territories. What is worse, the second outbreak sharply deteriorates the global anti-epidemic situation. Moreover the COVID-19 vaccine is still in process although the phase III trial revealed significant effect. The further influence of COVID-19 epidemic on global economy and

policy development, as well as human daily activities, is yet to know and estimate.

As a biomedical journal, CJTEE paid close attention to the development of COVID-19 and published an issue focused on its critical care. Professor Lin believes that COVID-19 should be viewed as a sepsis induced by viral infection, and thus recommended the immunomodulatory therapy in addition to etiological and supportive treatment. He elaborated the indications and contraindications of four options for immunomodulatory therapy, respectively Corticosteroids, Ulinastatin, Thymosin α 1, and Ulinastatin + Thymosin α 1. Publication of this article enables Prof. Lin more chances to communicate with international experts on the treatment of COVID-19.

CJTEE also follows the protection of physicians under the condition of COVID-19 epidemic. We published guidelines for surgical operations under the threat of COVID-19 infection, in terms of multidisciplinary cooperation, transport of patients, negative pressure operating rooms, protective levels, etc. Moreover we reported the first surgery on a confirmed COVID-19 case with thoracolumbar fracture, who achieved a good outcome after posterior open reduction and pedicle screw internal fixation.

CJTEE proposed that the most terrifying aspect of COVID-19 lies in its strong transmission, rather than the lethality, which brings a huge burden to the medical service system. Well protection of the medical human resources further strengthens the medical rescue ability. On the contrary, infection of a medical staff can easily cause cross-infection among medical workers and further deteriorate the collapsing of medical system. The painful lesson of SARS prompted

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the Chinese government to make the most strict protection measures for possible vulnerable people exposed to 2019-nCoV. It is reported that there is no infection among the more than 40,000 medical workers who aided Hubei Province.¹

As for the COVID-19, we do not know when it will be the end. But the relationship between human and virus must be coexistence and search a body dynamic balance, rather than extinction. At the times of highly developed technology and medical levels, confirming the infection source and cutting off the transmission route are still the basic and effective ways to prevent and control an epidemic. So we predict that 2019-nCoV may tend to have increased transmissibility but decreased virulence, with more and more asymptomatic infections.

Infection

When regarding COVID-19 and sepsis, we have to mention infection. CJTEE defines infection as the condition that pathogenic microorganisms invade the body, colonize and proliferate in the body, which further causes local or systemic toxic reactions. The understanding of infection in recent hundreds of years has greatly improved the development of modern medicine. Infection is a worrisome complication following trauma (especially severe trauma) and surgeries. No inflammation, no healing. But when the inflammatory response is out of control, there will be onset of inflammatory insults or even sepsis, which means prolonged hospitalization or death.

In the last issue of 2020, the source control in intra-abdominal infections (IAIs) and traumatic bone infections are discussed. IAI is a big challenging in clinical practice and may have several organs involved, which required urgent diagnosis and management. In recently years, the aging of population and accompanied chronic diseases in this group, as well as the prevalence of drug-resistance among both hospitals and community environments significantly influenced the success rate of IAI management.²

In CJTEE issue 6, Wu et al. proposed source control as the key point. They shared their opinion on the timing, adequacy, and procedures of source control. Almost all the related societies indicated that source control must be performed as soon as possible (no more than 24 h) by surgical (laparotomy or laparoscopy) or non-surgical (percutaneous drainage) approaches. Also physicians must be alert to inadequate source control, which may adversely affect the patients, especially critical cases. CJTEE proposed the necessity of multidisciplinary cooperation if combined with organ dysfunction.

Infection is a very common complication after bone surgery in clinical practice. Many factors may contribute to traumatic bone infection, including individual difference (age, gender, comorbidity, injury type, etc.) and hospital operation. Most of the published articles focus on its clinical incidence and treatment, while the basic research between pathogens, skeletal systems, immune systems and antibacterials is few.

Tang et al. comprehensively reviewed the literature and summarized the reported immune cells related to bone metabolism, including Th1, Th2, Th8, Treg cell, etc. Osteoclast is defined to be an essential effector for infection-related bone destruction. Immunomodulation and antibiotics on bone infection and metabolism were also discussed. The authors concluded that studies on how the immune pathways regulate bone metabolism is helpful to understand bone infection and promote corresponding management options, such as targeted therapy of cytokines in pathogenic factors.

After trauma, the inflammatory response and immunosuppression were activated at the same time. The post-traumatic inflammatory response itself is a protective response of the body. CJTEE believes that the secondary inflammatory injury following

continuous excessive inflammation is the predominant issue we need to focus on and deal with. However, at the time of controlling inflammatory response and preventing post-traumatic immune paralysis, enhancing the body's immune defense cannot be ignored.

Traffic medicine and trauma care system

The World Day of Remembrance for Road Traffic Victims has just passed. Road traffic collision (RTC) and trauma care system has always been a focus of CJTEE due to (1) RTC is the 8th leading cause of death and moreover the first killer among children and teenagers aged 5–29 years; (2) the death toll is huge: more than 1.3 million every year which means every 25 s a person died in RTC; and (3) most RTCs are preventable.³

From the several years of tracking report, CJTEE summarized the condition of road traffic problems as below:

Large regional differences

RTCs are closely related to the development of local economics. It is reported that the low-income countries own 1% of the world's vehicles but account for 13% of total RTC deaths; while the high-income countries own 40% of the world's vehicles but only 7% of total deaths. The mortality rate per 100,000 people in 2016 revealed a hierarchical phenomenon, respectively 26.6 in Africa and 9.3 in Europe.¹

The rapid global motorization inevitably brings about the growth of RTCs. How to balance the increase of social economy and RTCs is significant and reconcilable. The soul secret is the awareness. Take China for example, which was used to rank as the top RCT death country with crazy increase of vehicle ownership and RCT-related deaths. After a series of legislation on speed, drink-driving, driving license, public safety education, road facilities improvement, etc., the total number of RTCs and death has been largely decreased.⁴ It seems that some other developing countries are suffering from the pains and life loss China once experienced.

CJTEE holds the opinion that the existence of regional differences is an objective truth, mainly resulting from the differences in terms of terrain, population density, economic development, civilization level, etc. It is extremely difficult to require the whole world to reach the same goal at present. Considering the current situation of high total RTC mortality and morbidity, typical prevention strategies combined with local conditions should be encouraged. The measures, whether effective or ineffective, need to be reported. While simple epidemiological survey is of little significance.

Multiple risk factors

From the received articles all over the world regarding road traffic injuries, many risk factors have been analyzed, e.g. gender, weather, education level, time points, use of cell phone/social media while driving, even seasons. CJTEE summarizes them as safe roads, safe vehicles and safe road user behaviors. Safe roads cover basic road infrastructure, reasonable traffic signal setting; safe vehicles refer to various advanced safety setting for drivers, passengers and even pedestrians, like electronic stability control, advance braking, etc. (CJTEE once published the European New Car Assessment Programme with safety assessment in the year 2016); while safe road user behaviors include legislation on speed, drink-driving, helmet use, child restraint use and public education on road safety.

Confused data collection

Data collection on RTC morbidity and mortality is a global problem. In the era of big data, traffic medical data are widely used,

but few studies have traced the data source to check whether they are accurate and reliable. As we know, multiple functional departments are involved, i.e. the police department, forensic department, hospital emergency department or trauma center, etc. and there is no unified standard on what items or information should be collected.

Prof. Hu et al. stressed this serious issue. They listed the problems as absence of regular data, under-reporting, low specificity, distorted cause spectrum of road traffic injury, inconsistency, inaccessibility, and delay of data release. None of them can be neglected. Fortunately, their team also provides their own solutions, including (1) establish a multidisciplinary and independent road crash investigation team to be responsible for data collection in each country; (2) adopt standard data collection methods; (3) integrate multi-department data; (4) make the data be freely accessed by researchers and the public in an efficient manner; (5) use technology to reduce delays in data release.

Actually we think this is a question of responsibility and accountability. Moreover CJTEE must point out that until now, most of the published RTC data are related to traffic management department and trauma centers, while those from the forensic department and particularly the insurance department are largely ignored, which we believe may affect the accuracy and credibility of the data. The government should coordinate the cooperation among all involved departments and establish a corresponding system of rewards, penalties and competition mechanisms. Technically it is not difficult.

Prevention in priority and well established trauma care system can save more lives

Except for the significantly different incidence of RTCs, the survival rate also shows diverse outcomes between high-income and low-income countries. This is close with the golden emergency time and medical care level, which is further decided by the local economic level. Prof. Marc Maegele once reported that the emergency aircraft in Germany can reach any place in the country within 15 min and thus the wounded can obtain the most professional medical care. This is obviously unapproachable in most countries. China has officially required the second and above-class hospitals to set with a trauma center and CJTEE will track its development and effect. As for the low-income countries with the dominant RTC morbidity and mortality, CJTEE recommends that the most priority is to prevent RTCs, which is more practical and operable. In the future, hierarchical trauma centers need to be well set up, to send the right wounded to the right trauma center/emergency institution within the right time.

Vascular injury

Vascular injury is often caused by violence or high energy and exits from the ancient times. Iatrogenic arterial injury is another pattern in recent decades. But the vascular surgery is a new discipline, which was born in the war and developed after the World War II. Even today, only a few big hospitals have been set with this department. In the past 50 years, vascular technique has achieved great progress with the introduction of intervention.⁵

The guest editor, Prof. Jian-Long Liu, leader of the department of vascular surgery, Beijing Jishuitan Hospital, organized a special issue of vascular trauma for CJTEE. They systematically reviewed the treatment strategies of peripheral vascular trauma. Vascular injuries can be classified as penetrating and blunt based on the

injury mechanism, or as vasospasm, contusion, intimal disruption, laceration, etc. based on their types. Angiography is still the gold standard for diagnosis. As for management, immediate hemorrhage control and rapid restoration of blood flow are the primary goals. Surgical operation is the primary treatment and endovascular treatment can be a promising alternative. They also introduced their experiences in managing innominate arterial injury, thoracic aortic blunt injury, anterior communicating artery aneurysm, subclavian artery injury, ascending aorta disruption, vascular access pseudoaneurysm, etc.

Due to the increase of violent events, terrorist attack, RTCs and regional conflicts (like the Armenia-Azerbaijan Conflict), the incidence of vascular injury is rising. CJTEE believes that the development of vascular surgery technique is urgent for modern times, especially for military medicine. It is going to be one of the most promising disciplines in the future. But CJTEE has to warn that vascular injury management also needs to follow the basic rules: (1) patient general condition assessment, (2) the ABCDE rules in emergency care, (3) damage control and (4) saving lives being the top priority. In battlefield, if the circumstance and patient condition permit, further definite treatment can be conducted. For severe vascular injury patients, hemorrhage control and rapid resuscitation should be always the urgent, rather than vascular reconstruction.

Blast injury

Blast injury is another common injury in wars, normally following explosion, terrorism and industrial accidents. The emeritus editor in chief of CJTEE, Prof. Zheng-Guo Wang is the founder of trauma ballistics in China and thus CJTEE witnessed the development of blast injury in this country. In the 5th issue, two models were established: one goat blast lung injury model by Wang et al. to identify the key genes involved in this process and the other a finite element model to stimulate the natural fragment formation and injury to human thorax by Ju et al. from Naval Research Academy of PLA. They are representatives of traditional animal experiment and modern digital technique. Both are impressive and beneficial for understanding of blast injury.

Unfortunately we can see that the development of blast injury has a long history, but consensus beneficially guiding its clinical management are few. This is probably due to insufficient attention. Moreover, blast injury has three stages, respectively primary injury due to blast wave overpressure (eardrum rupture, lung injury, etc.) second injury due to flying debris, fragments (blunt or penetrating traumas, soft tissue injury) and tertiary injury due to impact with other objects like ground, wall, etc.⁶ Moreover, the environment at the injury scene is very complex, thus the risk of infection and burn injuries is pretty high. Also blast injury has the typical characteristics of mild superficial injury but severe inner tissue or visceral organ injuries. Basic studies on blast injuries to lungs are not uncommon, but those to the head, especially the encephalocoele, are far from enough. CJTEE recommends that military injuries deserve wider and deeper study to save more lives in future wars or conflicts.

Head and facial trauma

Maxillofacial surgery is a young subject, and the increase in violent events has accelerated its development. In 2017, CJTEE once organized a special issue on maxillofacial trauma from Loma Linda University, USA and University Hospital of Messina, Italy. Half of the

articles are among the most cited and most popular in CJTEE. At the beginning of the year 2020, Prof. Liu et al. from West China Hospital of Stomatology, one of the most famous hospitals on stomatology, contributed a readable review on mandibular condylar fracture management. They summarized six key points for its surgical management: virtual evaluation of condylar fracture, a suitable surgical approach, good reduction, stable internal fixation, repair of the articular disc, and restoration of the mandibular arch width. We believe that these points will help to improve the prognosis and successful treatment of mandibular condyle fractures. The authors also stressed a better preoperative plan and development of new instruments. We fully agree with them. In the same issue, authors from the same affiliation shared a case of penetrating head injury in a 15-year-old boy following fall onto a bamboo stick who failed in primary treatment in local hospital and sustained cerebrospinal fluid leak because of insufficient preoperative assessment and design. The boy lost his left eye. Also Kafali et al. from Turkey reported their finding that children with penetrating eye injury had a tendency to have a 3.5-fold increased risk for attention deficit and hyperactivity disorder ($OR = 3.538$, $CI = 0.960–13.039$, $p = 0.058$).

Head and face are different from other regions. The appearance result must be considered, especially for children and woman. Aesthetic effect should be especially considered and designed.

In the coming year 2021, CJTEE has organized a special issue on post-traumatic stress disorder (PTSD). Though PTSD has been frequently mentioned, there is definitely insufficient attention or recognition on this psychological problem. Hope these articles will be helpful for readers.

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Ethical statement

Ethical approval is unapplicable.

Declaration of competing interest

The authors declare no competing interest.

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