Introduction

Although traditionally associated with intravenous drug use, right-sided infective endocarditis (IE) is increasingly being diagnosed following complications from healthcare-associated procedures involving catheters and device implantation. We report a rare occurrence of right-sided IE secondary to intravenous use of traditional and complementary medicine (T&CM).

Case report

A 58-year-old man, with no known medical illnesses, was brought to the emergency department following a week history of dyspnoea, fever and malaise. On arrival, he appeared obtunded (Glasgow Coma Scale – Eyes 2, Verbal 2 and Motor 3) and vital signs include a blood pressure of 70/42 mmHg, pulse rate of 132/minute, respiratory rate of 30/minute, oxygen saturation 96% on room air and temperature of 38.7°C. Clinical examination revealed a pansystolic murmur of grade 4, but otherwise was unremarkable. The patient was intubated, mechanically ventilated and treated for possible septicemia shock with intravenous antibiotics (pipera-



venous bicarbonate levels of 14 mmol/l) with raised lactate levels of 11 mmol/l. Initial chest radiography did not reveal any consolidation. Blood cultures on admission revealed evidence of methicillin-sensitive Staphylococcus aureus (MSSA).

An initial transthoracic echocardiogram (TTE) was performed in view of the clinical murmur, and detected severe tricuspid regurgitation, but failed to reveal any vegetations or valvular masses (Figure 1). However, upon further collateral history it was revealed that the patient had undergone a form of T&CM, to improve general well-being, a month earlier via a local Chinese medicine shop. Although the exact ingredients were unknown, it was claimed to contain ‘natural herbs’ (Figure 2). Further information revealed that the patient had enrolled in a 10-session programme involving intravenous administration of T&CM. Following this additional information, a repeat TTE was performed with additional short-axis subcostal plane views to better visualize the tricuspid valve. This revealed a 1.2 cm × 0.8 cm mass located in the posterior segment of the posterior leaflet of the tricuspid valve, not initially visualized at the initial TTE.
parasternal plane inflow view (Figure 3). Urine toxicology was also performed, to rule out other substance misuse, which was unremarkable.

Following this, the patient was treated for MSSA IE with intravenous cloxacillin for a total of 6 weeks. Repeat TTE and transoesophageal echocardiography revealed resolution of the vegetation, with subsequent improvement in clinical state and blood investigations. However, there was further evidence of severe tricuspid regurgitation, due to a prolapsed posterior leaflet. Cardiothoracic surgeons were consulted, but the patient refused further intervention and had opted for periodic monitoring within an outpatient setting instead.

Discussion

Right-sided IE are uncommon (5–10% of total IE) and often associated with intravenous drug abuse, indwelling catheters and medical device implants. MSSA was the most common organism associated with right-sided IE (70%). Suggested pathogenesis includes damage of the valve from injected particulate (either via the substance itself or the organism) alongside immune function abnormalities. Based on our literature review, using English-based search engines including

Figure 1. Transthoracic echocardiography at the (a) apical four-chamber planes showing colour-flow imaging, (b) subcostal inferior vena cava view with pulsed-wave Doppler, showing hepatic reversal flow and (c) right ventricular inflow view with continuous wave Doppler, showing raised tricuspid regurgitation velocity and peak pressure gradient, all suggestive of severe tricuspid regurgitation.

Figure 2. Traditional Chinese ‘herbal’ medicine, including those packed in sachets which were administered intravenously in our patient over 10 sessions, of which the exact ingredients remain unknown.
that of PUBMED and MEDLINE, we were unable to find any other case reports or studies on IE following T&CM administra-
tion. However, direct causation of IE from T&CM products could not be concluded as no blood sampling of T&CM substances was performed. Our case report primarily aims to highlight how commonplace T&CM administration has become in our community and how it should be considered as potential cause of IE, regardless of the T&CM agent being administered.

The use of T&CM in Malaysia remains widespread (almost 70% of the population), with backing from the local government through the gazettement of the T&CM Act 2016 (Act 775) to regulate and standardize practice. Amongst the top preferred practices include Chinese (13.69%) and Malay herbs (10.07%). Although mainly use for ‘general wellness’, other reasons for use include minor ailments including myalgia, cough and back pain amongst others, and chronic illnesses such as stroke, diabetes and hypertension.

However, there is a lack of transparent data on the practice of intravenous T&CM at present, including safe handling, training and subsequent administration of products, unlike other countries, namely China. There also remains scarcity of data on complications following use of T&CM, including intravenous products. Although T&CM has been slowly integrated over the years into the public healthcare system, it remains separate with no mandatory registration of T&CM practitioners to this date. Furthermore, there exist private practices that remain outside the jurisdiction of Private Healthcare Facilities and Services Act 1998. Unlike China, where up to 109 types of injection-based medicine have been approved by the State Food and Drug Administration of China, Malaysia has yet to approve any intravenous T&CM to this date. As T&CM practice remains highly unregulated and with an estimated 15,000–20,000 T&CM practitioners locally, complications as grave as the one reported may become commonplace.

Conclusion

To our knowledge, this is the first-ever case reported of a right-sided IE following intravenous administration of T&CM in present literature. We expect a rise in cases as such unregulated therapy become widely available in Malaysia and across South-East Asia. Therefore, it is important to consider T&CM-related complications as part of the differential for right-sided IE in our local context.

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Authors’ Contributions

REFRS: Data collection & analysis, drafting of manuscript; SSK: Drafting of manuscript, revision of manuscript; EAR: Drafting of manuscript, revision of manuscript.

Conflict of Interest

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Ethics Approval & Consent

Ethical approval to report this case/these cases was obtained from the Universiti Teknologi MARA (UiTM) Ethics Committee (Ethics Committee Registration Number 04/2020). The manuscript does not report on any animal data or tissue.

Consent to Publish

Written informed consent was obtained from the patient for their anonymized information to be published in this article.

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Availability of Data and Materials

The data that support the findings of this study are available from UiTM Sungai Buloh but restrictions apply to the availability of these data, which were used under licence for the current study, and so are not publicly available. Data are, however, available from the authors upon reasonable request and with permission of UiTM Sungai Buloh.

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