Right sided endocarditis secondary to prolonged intravenous cannulation

Godsent Isiguzo, Collins Ugwu, Uma Kalu, Ndudi Obeka, Basil Ezeokpo

ABSTRACT

Introduction: Infective endocarditis still remains a burden in sub-Saharan Africa, due mainly to varied etiologies such as underlying rheumatic valvular heart disease, and HIV infection. Another often overlooked but seen risk factor is prolonged intravenous cannulation. In some cases, these are unnecessary and under unhygienic conditions, predisposing the unfortunate patients to right sided endocarditis. We present a case of tricuspid valve endocarditis secondary to prolonged intravenous cannulation.

Case Report: The index patient was 24-year-old female with four previous pregnancies, being treated for pulmonary tuberculosis. Following history of amenorrhea, she was erroneously diagnosed to have ectopic pregnancy, and was offered laparotomy, with prolonged intravenous cannulation. Few weeks later she developed features of heart failure, and echocardiography showed massive right sided endocarditis, but while on evaluation she had sudden death while in the toilet from most likely pulmonary embolism.

Conclusion: There is need to discourage prolonged intravenous access in resource poor settings while not underplaying the need to strive for best practices. At the same time there is need for manpower development in cardiovascular disease intervention so as to mitigate against prevent able cardiovascular mortality.
ABSTRACT

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Keywords: Infective endocarditis, Prolonged intravenous cannulation

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INTRODUCTION

Infective endocarditis still remains a disease associated with high morbidity and mortality, despite advances in cardiac health care [1]. Higher incidence is seen in patients with prosthetic valve devices, and congenital heart diseases [2]. Also rheumatic heart disease has continued to play active role in the prevalence of infective endocarditis especially in the developing world, while age related degenerative valvular heart disease, HIV, diabetes mellitus, chronic kidney disease...
and intravenous drug use are the major drivers in the developed world [3]. Antibiotics resistance has also been identified as contributing substantially to the burden of infective endocarditis all over the world [4], but more so in the poorer nations owing to poor health infrastructure, lack of control over drug availability, distribution and use as well as quackery. We in this case report seek to highlight one often neglected cause of infective endocarditis in the developing world.

**CASE REPORT**

A 24-year-old para 4 female presented with a history of 10-week cough, fever, and abdominal swelling. She was diagnosed to have pulmonary tuberculosis and started on therapy, subsequently she developed two months’ amenorrhea, and on finding of hemoperitoneum, a diagnosis of ectopic pregnancy was made in the clinic she was attending. She was offered exploratory laparotomy, and intraoperatively no evidence of ectopic pregnancy was seen. Subsequently, she developed wound dehiscence, and because of persistent cough and body swelling she was referred to a physician after five weeks in the peripheral clinic. This entire time patient was on intravenous cannula for fluid and drug administration.

The patient had no prior history of cardiac disease and was not positive for retroviral disease. Two weeks under the care of the receiving physician, she developed new onset fever, chest pain and palpitation, examination findings revealed fever (temperature 39.8°C), moderate pallor, bilateral ankle edema. Pulse rate 120 beats/minute, blood pressure 90/60 mmHg, S1S2S3 gallop, 2/6 pansystolic murmur at left lower sternal edge. Respiratory rate 38 cycles/minute, trachea central, reduced chest excursion and dull percussion notes on left lower zone, vesicular breath sound over right mid and lower zone, coarse inspiratory crepitations on the left lower posterior and lateral zones. The abdomen was distended, with clean laparotomy wound dressing, hepatomegaly 8 cm below right coastal margin, and ascites. Based on these findings she was referred by the initial physician to the cardiologist. Electrocardiogram showed sinus Tachycardia with low ORS voltage complex in limb leads, normal axis, RSR in V2, deep S waves in V5-V6, and poor R wave progression (Figure 1). Echocardiography showed globally reduced systolic function with ejection fraction of 40%, the posterior tricuspid valve was thickened, and freely mobile mass measuring 35x22 mm in the right ventricle protruding into the right atrium in systole. There was right ventricular dominance, severe tricuspid regurgitation and paradoxical septal motion (Figures 2–5). The assessment was sub-acute right sided infective endocarditis secondary to prolonged intravenous cannulation, complicated by congestive cardiac failure. Available results showed a total white blood count of 12000 (neutrophils 42%, lymphocytes 55%, monocytes 3%), packed cell volume (PCV) 24%, random blood sugar (RBS) 137 mg/dl, retroviral screening (RVS) non reactive, blood culture grew *Staphylococcus aureus*. Patient had been on antibiotics prior to presentation to us, but based on sensitivity result, she was started on ceftriazone, gentamicin and metronidazole. We also asked for clotting profile (Activate partial thromboplastin time, bleeding time, INR, prothrombin time), and started on frusemide, spironolactone, lisinopril and subcutaneous clexane. Ten days later patient collapsed in the bathroom and resuscitation was unsuccessful. Presumed cause of death was pulmonary embolism, but relatives declined autopsy.

**DISCUSSION**

Infective endocarditis remains a serious disease, and by far the most common cardiovascular infection with considerable risk of death and mortality [1].

Its initial description dates back to the 17th century when Lazaire Riviere first described gross autopsy findings of the disease in 1646 [5]. In 1885, William...
Osler in his lecture at the Royal college of Physicians of England gave a comprehensive description of infective endocarditis [6]. However, echocardiographic description waited years later when M mode recording of mitral valve, showed the valve as thickened with a non-uniform shaggy appearance [1].

Infective endocarditis has an estimated annual incidence of 3–9 cases per 100,000 persons in developed world [7], with age and sex adjusted incidence of infective endocarditis ranging from 5–7 cases/10,000 person years [8]. The spectrum of infective endocarditis in developed countries is changing due mainly to an increase of newer risk factors such as long-term use of hemodialysis, increasing prevalence of diabetes mellitus, rising rate of prostatic valve placements, increasing rise of central lines and devices and reduction in incidence of rheumatic fever [9]. Studies among African adults are few, most reports focused on children [10, 11], but as far back as 1968, bacteria endocarditis accounted for 2.2% of all cardiovascular disease admissions in Uganda [12].

In a retrospective study in Morocco, mean age of patients was 27.7 years (range 11–65) with male preponderance (62.8%). Sixty-three percent of patients had infective endocarditis secondary to rheumatic heart disease (RHD), with 29.9% being primary [10]. Another study from Nigeria found underlying heart disease in 90% with 60% of these having RHD and 28% with underlying congenital heart disease [11]. In a South African prospective study with mean age 37.7 years, male to female ratio was 1.6:1; RHD was still the predominant predisposing risk (76.6%), while 17% had previous prosthetic valves [12].

In industrialized countries, infective endocarditis has an estimated annual incidence of 3–9 cases per 100,000 [5], the exact incidence in developing nations is not known, however most such cases are related to underlying RHD, of which there are 470,000 new cases diagnosed worldwide each year [13].

Our index patient’s attributed risk factor was prolonged intravenous cannulation, one that is rife in most third world, but ignored in literature. Its prominence in resource poor settings where intravenous drug use is limited has been blamed on unregulated drug use and quackery. This etiology is not entirely new, only overlooked, having been alluded to by Vuyisile T Nkomo in a review [14] where he reported of series of 12 cases of tricuspid valve endocarditis, 11 of them after “clandestine” abortions, collected over a period of eight years reported from Brazzaville, Congo, drawing attention to other causes of infective endocarditis [15]. The patient presented with palpitation, features of heart failure and new onset murmur. She did not have the classical peripheral stigmata of infective endocarditis (which include valvular and peripheral embolic and immunological vascular phenomenon). However, this is uncommon and have been shown to be often absent in patient with acute right sided endocarditis, those caused by Staphylococcus aureus and infective endocarditis following HACEK organisms.
Infections and associated with is now the most of this disease include improvement of diagnostic with a high mortality rate [24]. Challenges in management system emboli lodge in the distribution of the middle central nervous system, and 90% of central nervous extremities. Up to 65% of embolic events involve the including lungs, coronary arteries, spleen, bowel, and is embolism. Emboli often involve major arterial beds, including lungs, coronary arteries, spleen, bowel, and extremities. Up to 65% of embolic events involve the central nervous system, and 90% of central nervous system emboli lodge in the distribution of the middle cerebral artery [23]. These latter emboli are associated with a high mortality rate [24]. Challenges in management of this disease include improvement of diagnostic strategies to reduce delays for the start of appropriate treatment, better identification of patients who require close monitoring and urgent surgery, and development of new medical and surgical therapeutic methods.

CONCLUSION

Developments in cardiology practice, cardiac interventions and rational antibiotics use have greatly improved the outcome in infective endocarditis, however, ignorance and preventable bad clinical practices such as ill timed and unnecessary intravenous lines in some low and medium income countries indirectly fuel the resurgence of infective endocarditis in such climes. This calls for concerted efforts of all and sundry aimed at mitigating this cause of morbidity and mortality.

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Author Contributions

Godsent Isiguzo – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Collins Ugwu – Substantial contributions to conception and design, Analysis and interpretation of data, Drafting the article, Final approval of the version to be published

Uma Kalu – Substantial contributions to conception and design, Analysis and interpretation of data, Drafting the article, Final approval of the version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

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(Haemophilus species, Aggregatibacter [Actinobacillus] actinomycetemcomitans, Cardiobacterium hominis, Eikenella corrodens and Kingella kingae) [16]. Our patients’ echocardiography showed a huge mass attached to the tricuspid valve, and oscillating with each contraction between the right ventricle and atrium, in addition there was positive history of risk factor (prolonged IV access) fever (Temperature 38.5°C) and new onset cardiac murmur. The blood culture was negative, attributable to prior antibiotics use/abuse, and similar to the finding in a South African study were proportion of “culture-negative” infective endocarditis was high, explained by exposure to antibiotics before blood culture sampling [12]. In their findings, etiological diagnosis was made in 44.7% of cases of definitive infective endocarditis and none of the possible cases of infective endocarditis and in their opinion, this was low compared to published data and international standards [17, 18]. In the USA, culture negative endocarditis constitutes only 2.5–3% of all infective endocarditis diagnosed [19] while in the Netherlands the figure is even lower at 1.1% [18]. In France, blood culture was negative in 88 of 620 (14%) of infective endocarditis documented during one-year nationwide survey [20]. In 42 of the 88 cases, negative culture was associated with administration of antibiotics before collection as was the case in the index patient.

Most common microorganism associated with infective endocarditis are gram negative bacteria including Staphylococcus aureus, Streptococcus and Enterococcus, the three accounting for more than 80% of all cases. However, Staph aureus is now the most frequent organism isolated in all forms of infective endocarditis, with MRSA accounting for an increasing portion of S. aureus infections and associated with previous hospitalizations, long-term addiction, and non-prescribed antibiotic use [21].

The outcome in this our index patient was poor, and the cause of death most likely from an embolic event, contributed to by our inability to offer her surgery considering the size of the intra-cardiac mass. However, she had features of congestive heart failure, which if seen in infective endocarditis, irrespective of the course or mechanism, portends a grave prognosis with medical therapy alone. It is also the most powerful predictor of poor outcome with surgical therapy [22]. In the reports from Morocco and Nigeria, the mortality was 28.7% [10] and 47% [11] respectively, both related to refractory heart failure, while six months’ mortality in the South African study was 35.6%.

Another grave complication and predictor of mortality is embolism. Emboli often involve major arterial beds, including lungs, coronary arteries, spleen, bowel, and extremities. Up to 65% of embolic events involve the central nervous system, and 90% of central nervous system emboli lodge in the distribution of the middle cerebral artery [23]. These latter emboli are associated with a high mortality rate [24]. Challenges in management of this disease include improvement of diagnostic...
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