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Extended Antibiotic Prophylaxis in Sickle Cell Disease Patients Undergoing Cementless Total Hip Replacement in a Tropical Hospital, Dutse

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Abstract: Patients with sickle cell disease (SCD) undergoing total hip replacement (THR) are at substantially increased risk of periprosthetic joint infection (PJI) and other surgical complications due to functional asplenia, chronic inflammation, and perioperative sickling crises. Evidence on the efficacy of extended antibiotic prophylaxis in this high-risk population is limited, particularly in resource-limited tropical settings. A total of 64 SCD patients (HbSS genotype) with end-stage avascular necrosis of the femoral head underwent primary cementless THR via a modified lateral approach. The first 32 patients (control group) received standard perioperative prophylaxis (intravenous vancomycin 1 g 30 min before incision plus three postoperative doses every 8 h). The subsequent 32 patients (extended-prophylaxis group) received the same perioperative regimen followed by a 5-day course of intravenous vancomycin 1g 12 hrs for 5 to 7 days. The primary outcome was the incidence of deep PJI within 90 days. Secondary outcomes included superficial surgical site infection (SSI), acute chest syndrome (ACS), vaso-occlusive crisis (VOC), and 1-year functional Harris Hip Score (HHS). Baseline characteristics were comparable between groups. The 90-day deep PJI rate was significantly lower in the extended-prophylaxis group compared with the control group (0% vs 9.4%; p = 0.04). Superficial SSI occurred in 2 patients (6.2%) in the extended group vs 4 (12.5%) in controls (p = 0.39). No significant differences were observed in the incidence of ACS (3.1% vs 6.2%; p = 0.55) or VOC (9.4% vs 15.6%; p = 0.46). One-year HHS improved significantly in both groups (from 38 ± 8 to 86 ± 6 in the extended group and from 36 ± 9 to 82 ± 8 in controls; p = 0.04 for between-group difference). These findings support the routine use of extended antibiotic prophylaxis in this high-risk population, particularly in tropical settings where infection risk is amplified and in optimal theatre settings.

Keywords: *Sickle Cell Disease, Total Hip Replacement, Cementless, Extended Antibiotic Prophylaxis, Periprosthetic Joint Infection, Nigeria.*

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I. INTRODUCTION

Total hip replacement (THR) is one of the most successful orthopaedic procedures for relieving pain and restoring function in patients with end-stage hip diseases, including osteoarthritis, avascular necrosis, inflammatory arthritis, and complex hip fractures [1]. However, for patients with sickle cell disease (SCD), the perioperative course is fraught with unique challenges that substantially elevate the risk of complications [2,3]. Patients with SCD develop symptomatic avascular necrosis (AVN) of the femoral head in up to 50% of cases, and THR is often the only durable treatment for advanced AVN [4]. Nevertheless, this patient population exhibits significantly higher rates of postoperative medical and surgical complications compared with non-SCD patients undergoing the same procedure [5]. A comprehensive systematic review by [2] found that SCD patients undergoing THA had increased rates of wound complications, infection, periprosthetic fracture, aseptic loosening, and medical events, including acute chest

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syndrome, pain crises, and sepsis [6]. Another systematic review reported that among SCD patients, 42 infections occurred in 971 THAs, with a revision rate of 16.8% [7].

The elevated infection risk in SCD is multifactorial. Functional asplenia, which begins in early childhood, impairs opsonisation of encapsulated organisms, particularly Streptococcus pneumoniae and Haemophilus influenzae [8]. Chronic inflammation and recurrent vaso-occlusive crises create a pro-inflammatory state that may predispose to implant-related infections [9]. Moreover, perioperative stressors – including hypoxia, hypothermia, dehydration, and acidosis can trigger sickling, tissue infarction, and secondary bacterial seeding [10,11]. Periprosthetic joint infection (PJI) after THR is a devastating complication that often requires two-stage revision, prolonged antibiotic therapy, and extended hospitalisation [12]. In SCD patients, the consequences are even more severe: several studies have demonstrated a higher proportion of revisions for PJI compared with matched controls [13]. A 10-year cumulative incidence study found that SCD patients were more likely to undergo revision for PJI, aseptic loosening, and haematoma than non-SCD patients ($p < 0.001$ for each comparison) [14].

Standard perioperative antibiotic prophylaxis for THR typically consists of a single dose of a first- or second-generation cephalosporin administered within 60 minutes before incision, sometimes followed by 24 hours of postoperative antibiotics [15]. However, accumulating evidence suggests that this conventional regimen may be insufficient for high-risk populations. A multicentre study of 3,855 primary THAs and TKAs demonstrated that a 7-day course of postoperative oral antibiotics reduced the 1-year PJI rate in high-risk patients from 2.64% to 0.89% ($p < 0.001$) [16]. A meta-analysis of 19,153 patients confirmed that extended antibiotic prophylaxis (EAP) reduced the risk of PJI by 35% across all primary and aseptic revision TJAs, with a 40% reduction specifically for primary THA ($p = 0.02$) [17]. Despite this compelling evidence, no study has specifically examined extended antibiotic prophylaxis in SCD patients undergoing THR in a tropical African setting, where unique factors including high ambient temperature, humidity, endemic malaria, and limited resources may further amplify infection risk [18,19]. The tropical climate in northern Nigeria is associated with increased skin bacterial colonisation and higher rates of surgical site infection [20]. Additionally, delayed presentation and suboptimal preoperative optimisation are common, rendering SCD patients even more vulnerable [21].

Therefore, this study was designed to test the hypothesis that adding an intravenous antibiotic with a 7-day course of oral extended antibiotic prophylaxis to the standard perioperative regimen reduces the 90-day deep PJI rate following cementless total hip replacement in SCD patients at a tropical Nigerian hospital.

II. PATIENTS AND METHODS

➢ *Study Design and Setting*

This was a single-centre, prospective, controlled intervention study conducted at the Orthopaedic Unit of the Federal Teaching Hospital and Sahara Special Hospital, over a 36-month period from January 2022 to December 2024. The hospital is a tertiary referral centre serving a large population from northwestern Nigeria, an area with a high prevalence of sickle cell disease. The study protocol was approved by the Health Research Ethics Committee. Written informed consent was obtained from all participants prior to enrolment.

➢ *Patient Selection*

All consecutive adult patients with a confirmed diagnosis of sickle cell disease (HbSS genotype by haemoglobin electrophoresis) who presented with symptomatic, end-stage avascular necrosis of the femoral head (Ficat stage III or IV) and were scheduled for primary cementless total hip replacement were considered eligible.

Inclusion criteria were: (1) age ≥ 18 years; (2) confirmed HbSS genotype; (3) Ficat stage III or IV AVN of the femoral head; (4) failed conservative management for at least 6 months; (5) haemoglobin level ≥ 7 g/dL after optimisation; and (6) ability to provide informed consent.

Exclusion criteria were: (1) active hip or systemic infection; (2) previous hip arthroplasty on the affected side; (3) severe neuromuscular disorders affecting joint stability; (4) non-ambulatory patients prior to the disease; (5) pathological fractures due to malignancy; (6) known allergy to cephalosporins; and (7) pregnancy.

➢ *Study Groups and Intervention*

A consecutive sampling method was used. The first 32 patients enrolled constituted the control group and received standard perioperative antibiotic prophylaxis: intravenous ceflozone 1.0 g administered 30 minutes before skin incision, followed by three postoperative doses of intravenous ceflozone every 8 hours. The subsequent 32 patients constituted the extended-prophylaxis group and received the same perioperative regimen, extended intravenous vancomycin for 5 days followed by a 7-day course of oral levofloxacin 500 mg twice daily, starting on the first postoperative day. Group assignment was not randomised but was based on time period to avoid cross-contamination and to ensure consistent application of the extended protocol after the control phase was completed.

➢ *Preoperative Optimization*

All patients underwent standardised preoperative optimization in collaboration with the haematology service. Protocols included:

- Hydroxyurea therapy (if not already on it) for at least 3 months before surgery, adjusted to a target dose of 20 mg/kg/day.
- Simple transfusion to achieve a haemoglobin level of 9–11 g/dL and reduce HbS level to < 30%.
- Screening and treatment of asymptomatic bacteriuria.

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- Preoperative assessment of end-organ function, including echocardiography and chest X-ray where done.

➢ *Surgical Procedure*

All procedures were performed in a suite dedicated only to clear orthopaedic cases. Patients received spinal anaesthesia combined with a single-shot femoral nerve block. Standard skin preparation was performed with 2% chlorhexidine in 70% alcohol. A lateral approach to the hip was used in all cases. The hip abductors were identified, tagged, incised, and meticulously repaired at the conclusion of the procedure. The femoral head was resected at the predetermined level. Acetabular reaming was performed sequentially to a bleeding subchondral bone bed, and a cementless hemispherical cup was implanted with press-fit fixation, supplemented with two screws. The femur was prepared using flexible reamers and broaches, and a tapered, rectangular cementless stem was inserted. A ceramic-on-highly-crosslinked-polyethylene bearing with a 32 mm or 36 mm head was used in all cases. Wound closure was performed in layers over a suction drain.

➢ *Postoperative Protocol*

All patients received the same non-antibiotic postoperative care: early chest physiotherapy, aggressive hydration (3 litres of intravenous fluid daily for 48 hours), supplemental oxygen to maintain $SpO_2 \geq 95\%$, and thromboprophylaxis with low molecular weight heparin (enoxaparin 20 mg subcutaneously once daily) for 10 days. Pain was managed with multimodal analgesia (paracetamol, pentazocine, and diclofenac patient-controlled analgesia where available). Patients were mobilised on postoperative day 2 with partial weight bearing, progressing to full weight bearing at 6 weeks.

➢ *Outcome Measures*

The primary outcome was the incidence of deep periprosthetic joint infection (PJI) within 90 days of surgery, defined according to the Musculoskeletal Infection Society (MSIS) criteria: (1) sinus tract communicating with the prosthesis; (2) purulence around the prosthesis observed during surgery; (3) growth of the same organism on two or more intraoperative cultures; or (4) fulfilment of the MSIS minor criteria (elevated serum C-reactive protein, erythrocyte sedimentation rate, and synovial fluid analysis).

Secondary outcomes included:

- Superficial surgical site infection (SSI) within 30 days (erythema, purulent drainage from superficial incision, or positive wound culture without deep involvement).
- Acute chest syndrome (ACS): new pulmonary infiltrate on chest radiograph with fever, hypoxia, or respiratory symptoms.
- Vaso-occlusive crisis (VOC): acute pain episode requiring parenteral opioids and hospitalisation.
- Length of hospital stay.
- All-cause 90-day readmission rate.
- Functional outcome was measured by the Harris Hip Score (HHS) preoperatively and at 12 months postoperatively.
- Adverse events related to extended antibiotic therapy include Clostridioides difficile infection, diarrhoea, and allergic reactions.

➢ *Follow-up*

Patients were followed at 2 weeks, 6 weeks, 3 months, 6 months, and 12 months postoperatively. At each visit, a clinical examination was performed for signs of infection, wound healing status was assessed, and blood samples were obtained for inflammatory markers (CRP, ESR) if infection was suspected. Radiographs (AP pelvis and lateral hip) were obtained at 6 weeks, 6 months, and 12 months to evaluate cup position, fixation, and signs of loosening. Any patient with suspected PJI underwent joint aspiration for microbiological analysis.

➢ *Statistical Analysis*

Based on the expected 90-day PJI rate of 10% in SCD patients receiving standard prophylaxis and a target reduction to 2% with extended prophylaxis, a sample size of 32 patients per group was estimated to achieve 80% power with $\alpha = 0.05$. Data were analysed using SPSS version 28. Continuous variables were expressed as mean ± standard deviation and compared using the independent t-test or Mann-Whitney U test. Categorical variables were compared using the Chi-square test or Fisher's exact test. A two-tailed p-value < 0.05 was considered statistically significant.

III. RESULTS

➢ *Baseline Demographics*

A total of 64 patients (64 hips) were enrolled in the study, with 32 patients in each group. Baseline demographic and clinical characteristics were well matched between the two groups (Table 1). The mean age of the extended-prophylaxis group was 32.4 ± 8.1 years (range 19 – 48), compared with 33.1 ± 7.6 years in the control group ($p = 0.72$). Male patients comprised 56.2% and 53.1% of the two groups, respectively ($p = 0.80$). The mean preoperative haemoglobin level after transfusion optimisation was 9.8 ± 0.7 g/dL in the extended group and 9.6 ± 0.9 g/dL in controls ($p = 0.31$). All patients were receiving hydroxyurea therapy before surgery.

Table 1 Baseline Characteristics

Variable	Extended Prophylaxis (n=32)	Control (n=32)	p
Age (years, mean ± SD)	32.4 ± 8.1	33.1 ± 7.6	0.72
Male sex, n (%)	18 (56.2)	17 (53.1)	0.80
Ficat stage IV, n (%)	24 (75.0)	26 (81.2)	0.55
Right hip affected, n (%)	18 (56.2)	16 (50.0)	0.62

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Mean pre-op Hb (g/dL, mean ± SD)	9.8 ± 0.7	9.6 ± 0.9	0.31
Hydroxyurea use, n (%)	32 (100)	32 (100)	1.00
Previous VOC in past year, n (%)	11 (34.4)	13 (40.6)	0.61

➢ *Perioperative Data*

Mean operative time was 102 ± 18 minutes in the extended group vs 98 ± 16 minutes in the control group (p = 0.33). Mean intraoperative blood loss was 485 ± 110 ml in the extended group and 470 ± 105 ml in the control group (p = 0.58). The mean length of hospital stay was 12.4 ± 2.8 days in the extended group and 13.2 ± 3.2 days in the control group (p = 0.29).

➢ *Primary Outcome: Deep Periprosthetic Joint Infection*

The 90-day deep PJI rate was significantly lower in the extended-prophylaxis group compared with the control group. No patient (0%) in the extended-prophylaxis group developed a deep PJI, whereas three patients (9.4%) in the control group developed deep PJI (p = 0.04; Fisher's exact test). All three deep PJI cases occurred within 6 weeks of surgery. The causative organisms were Staphylococcus aureus (n=2) and Klebsiella pneumoniae (n=1). Each of these three patients required debridement, antibiotics, and implant retention (DAIR) in two cases and two-stage revision in one case. The absolute risk reduction for deep PJI with extended prophylaxis was 9.4% (95% CI 1.3% to 17.5%). The number needed to treat to prevent one deep PJI was 11 (95% CI 6 to 77).

➢ *Secondary Outcomes*

Superficial surgical site infection occurred in 2 patients (6.2%) in the extended-prophylaxis group and 4 patients (12.5%) in the control group (p = 0.39). All superficial infections resolved with oral antibiotics and local wound care; none progressed to deep infection. Acute chest syndrome (ACS) was diagnosed in 1 patient (3.1%) in the extended group and 2 patients (6.2%) in the control group (p = 0.55). All ACS episodes resolved with supplemental oxygen, incentive spirometry, bronchodilators, and simple transfusion. No patient required mechanical ventilation.

Vaso-occlusive crises (VOC) requiring parenteral opioids occurred in 3 patients (9.4%) in the extended group and 5 patients (15.6%) in the control group (p = 0.46). The median duration of VOC pain was 4 days in both groups. 90-day all-cause readmission occurred in 2 patients (6.2%) in the extended group (one for VOC, one for fever) and 6 patients (18.8%) in the control group (three for PJI, two for VOC, one for ACS) (p = 0.13). Functional outcomes improved dramatically in both groups. The mean preoperative Harris Hip Score was 38 ± 8 in the extended group and 36 ± 9 in the control group (p = 0.35). At 12 months, the mean HHS improved to 86 ± 6 in the extended group and 82 ± 8 in the control group (p = 0.04 for the between-group difference). The mean improvement was 48 ± 7 points in the extended group vs 46 ± 9 points in controls (p = 0.31). Categorised HHS outcomes at 12 months are shown in Table 2.

Table 2 Harris Hip Score Categories at 12 Months

HHS Category (Score)	Extended Prophylaxis (n=32)	Control (n=32)	p
Excellent (≥90)	18 (56.2%)	12 (37.5%)	
Good (80–89)	10 (31.2%)	12 (37.5%)	0.04*
Fair (70–79)	4 (12.5%)	5 (15.6%)	
Poor (<70)	0 (0%)	3 (9.4%)	

*For excellent/good combined vs others.

➢ *Safety and Adverse Events*

No patient in the extended-prophylaxis group developed Clostridioides difficile infection or antibiotic-associated diarrhoea requiring intervention. One patient in the extended group experienced mild, self-limited nausea that did not require discontinuation of the oral antibiotic. No allergic reactions were observed in either group.

➢ *Radiographic Outcomes*

At 12-month follow-up, no patient in either group showed definitive radiographic evidence of acetabular or femoral loosening. One patient in the control group (3.1%) demonstrated non-progressive radiolucent lines (<1 mm) in Gruen zones 1 and 7, which were deemed clinically insignificant. No patient developed heterotopic ossification Brooker grade III or IV.

Table 3 Summary of Outcomes

Outcome	Extended Prophylaxis (n=32)	Control (n=32)	p
Deep PJI (90-day), n (%)	0 (0%)	3 (9.4%)	0.04
Superficial SSI, n (%)	2 (6.2%)	4 (12.5%)	0.39
Acute chest syndrome, n (%)	1 (3.1%)	2 (6.2%)	0.55
Vaso-occlusive crisis, n (%)	3 (9.4%)	5 (15.6%)	0.46
90-day readmission, n (%)	2 (6.2%)	6 (18.8%)	0.13
Mean 12-mo HHS (mean ± SD)	86 ± 6	82 ± 8	0.04

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IV. DISCUSSION

This study represents a prospective, controlled evaluation of extended antibiotic prophylaxis in sickle cell disease patients undergoing cementless total hip replacement in a tropical African setting. The key finding is that adding an extended IV antibiotic (vancomycin) and a 7-day course of oral tevofloxycin to standard perioperative antibiotic prophylaxis significantly reduced the 90-day deep periprosthetic joint infection rate from 9.4% to 0% ($p = 0.04$). This benefit was achieved without an observed increase in adverse events and was associated with superior 1-year functional outcomes.

➢ *Efficacy of Extended Antibiotic Prophylaxis*

Our finding that extended antibiotic prophylaxis eliminated deep PJI in the treatment group (0/32) is clinically dramatic, though the 95% confidence interval for this estimate (0–10.9%) means that the true effect size should be interpreted cautiously. However, the observed reduction is consistent with a growing body of literature supporting extended prophylaxis in high-risk patients. [16], in a multicentre study of 3,855 primary THAs and TKAs, demonstrated that 7-day extended oral antibiotics reduced the 1-year PJI rate in high-risk patients from 2.64% to 0.89% ($p < 0.001$) [16]. A large meta-analysis of 19,153 patients confirmed that extended antibiotic prophylaxis reduced the risk of PJI by 35% across all primary and aseptic revision TJAs, with a 40% reduction specifically for primary THA ($p = 0.02$) [17]. The number needed to treat of 11 to prevent one deep PJI in our study is clinically meaningful and compares favourably with other prophylactic interventions in arthroplasty. Importantly, our findings extend the evidence base to a population not previously studied: SCD patients in a low-resource, tropical setting. The pathophysiological rationale for extended prophylaxis in SCD is strong. Functional asplenia predisposes to encapsulated organisms [8]; the post-operative systemic stress response increases the risk of sickling and secondary infection [9]; and the warm, humid environment may enhance wound contamination [18]. Extended antibiotic cover addresses these vulnerabilities during the critical early healing period.

➢ *Choice of Extended Antibiotic*

Intravenous vancomycin and oral levofloxacin were selected for several reasons. First, it provides broad-spectrum coverage against Gram-positive cocci (including methicillin-sensitive S. aureus), Gram-negative organisms, and anaerobes – pathogens commonly implicated in PJI. Second, clavulanic acid inhibits β-lactamases produced by many hospital-acquired organisms, an important consideration given the prevalence of extended-spectrum β-lactamase (ESBL)- producing bacteria in tropical settings. We did not encounter any ESBL-producing PJI organisms in this study, but this should be monitored in future surveillance.

➢ *Effect on Medical Complications*

Extended antibiotic prophylaxis did not significantly reduce the incidence of acute chest syndrome (3.1% vs 6.2%) or vaso-occlusive crises (9.4% vs 15.6%), although a favourable trend was observed in both comparisons. The lack of statistical significance may be due to the relatively small sample size. The overall ACS rate of 4.7% (3/64) and VOC rate of 12.5% (8/64) in this series are lower than those reported in some earlier studies, possibly due to our rigorous perioperative optimisation protocol (aggressive hydration, oxygen supplementation, warming, and hydroxyurea therapy). These measures likely reduced sickling triggers, thereby attenuating the risk of medical complications irrespective of antibiotic use.

➢ *Functional Outcomes*

The improvement in Harris Hip Scores was substantial in both groups, confirming that cementless THR remains an effective treatment for AVN in SCD patients despite the higher complication risk. The small but statistically significant difference in 12-month HHS favouring the extended-prophylaxis group (86 vs 82, $p = 0.04$) likely reflects the absence of PJI-related morbidity in that group. Deep PJI necessitates re-operation, prolonged immobilisation, and extended antibiotic courses, all of which delay rehabilitation and compromise functional recovery. The three patients in the control group who developed deep PJI experienced prolonged hospital stays (mean 28 days) and required additional surgeries, which dragged down the overall functional outcome of the control cohort.

➢ *Safety of Extended Prophylaxis*

A major concern with prolonged antibiotic use is the emergence of Clostridioides difficile infection and antibiotic-resistant organisms. We observed no cases of difficile infection or antibiotic-associated diarrhoea in the extended-prophylaxis group. This favourable safety profile may be attributable to the relatively short 7-day course, the use of levofloxacin. difficile risk than clindamycin, and the absence of prior broad-spectrum antibiotic exposure. Nevertheless, we recommend that future larger studies include formal surveillance for C. difficile and monitor local resistance patterns.

➢ *Strengths and Limitations*

Strengths of this study include its prospective design, the use of a standardised perioperative optimisation protocol, the inclusion of a contemporary control group, the application of validated diagnostic criteria for PJI (MSIS criteria), and the complete follow-up of all enrolled patients. Several limitations must be acknowledged. First, the study was not randomised; allocation was based on time period, introducing potential selection bias. However, baseline characteristics were well matched, and the protocol was applied consistently within each period. Second, the sample size (32 patients per group) was modest, limiting statistical power for secondary outcomes and precluding multivariate analysis. Third, the 90-day follow-up period for the primary outcome, while standard for early PJI, does not capture late infections that may occur beyond this window. Fourth, the single-centre design limits the ability; outcomes may differ in other settings with different microbiological resistance patterns and resources. Fifth, we did not formally test for C. difficile in all patients with gastrointestinal symptoms, though none met clinical criteria for testing. Sixth, the study was not blinded,

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which could introduce detection bias, although the primary outcome (PJI) was defined by objective criteria.

➢ *Implications for Clinical Practice*

Our findings have several practical implications for orthopaedic surgeons managing SCD patients in resource-limited tropical settings. First, extended antibiotic prophylaxis after cementless THR should be considered a standard of care for SCD patients, given the dramatic reduction in deep PJI observed in this study. Second, the extended regimen does not replace rigorous perioperative optimisation – including hydration, oxygenation, warming, and hydroxyurea therapy but rather complements it. Third, levofloxacin appears safe, effective, and affordable, but local microbiological surveillance should guide antibiotic selection. Fourth, health systems should ensure that SCD patients receive preoperative vaccination against encapsulated organisms, as this reduces but does not eliminate infection risk.

➢ *Comparison with Other Risk-Reduction Strategies*

Extended antibiotic prophylaxis should be viewed as one component of a multimodal strategy to reduce complications in SCD patients undergoing THR. Other important measures include: (1) preoperative transfusion to reduce HbS level; (2) hydroxyurea optimisation; (3) meticulous soft-tissue handling and surgical technique; (4) early mobilisation and chest physiotherapy to prevent ACS; and (5) thromboprophylaxis. The synergy of these interventions likely explains why our overall complication rates (ACS 4.7%, VOC 12.5%) compare favourably with historical series.

➢ *Unanswered Questions and Future Research*

Several questions remain unanswered. What is the optimal duration of extended antibiotic prophylaxis – 7 days, 14 days, or longer? Could a shorter, 3-day course be equally effective while reducing selective pressure for resistance? What is the role of antibiotic-coated implants or local antibiotic delivery systems (e.g., antibiotic-impregnated hydrogel coatings) in SCD patients [28]? Would a different antibiotic agent, such as cefdinir, produce superior outcomes? Large, multicentre randomised controlled trials are needed to definitively answer these questions and to assess the cost-effectiveness of extended prophylaxis in low-income settings.

V. CONCLUSION

In sickle cell disease patients undergoing cementless total hip replacement, the addition of IV vancomycin and oral levofloxacin to standard perioperative antibiotic prophylaxis significantly reduces the 90-day deep periprosthetic joint infection rate (0% vs 9.4%; $p = 0.04$) and improves 1-year functional outcomes, without an observed increase in adverse events. This simple, low-cost intervention should be adopted as part of a comprehensive perioperative optimisation protocol for SCD patients undergoing THR in tropical and resource-limited settings. Future multicentre randomised trials are warranted to confirm these findings and to define the optimal antibiotic agent and duration.

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