



ORIGINAL RESEARCH PAPER

Health Science

SURGICAL SITE INFECTION IN NEUROSURGERY DEPARTMENT : SYSTEMATIC ANALYSICS OF EXISTING LITERATURE

KEY WORDS:Health care associated infection, post operative neurosurgical site infection, antibiotic prophylaxis, Neurosurgical procedures.

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ABSTRACT

BACKGROUND: Neurosurgical surgical site infection is frequently studied as a healthcare- associated infection and as a special case for neurosurgery site infection in developing country. Wide range of infections is associated with neurosurgery. Complete eradication of surgical site infection is Ideal but not in practice. How to prevent or to control Neurological SSIs, lots of literatures and guidelines are available. This article is about analysis and summarizes so neurosurgical students and surgeons have compact literature.

METHOD AND MATERIALS: We have conducted systematic literature review on empirical research regarding epidemiology and guidelines of SSIs in neurosurgery.

Literature: The literatures we have included are 1. Published in a Peer-reviewed journals 2. Conference lectures and papers. 3. Workshop published outcomes. 4. Symposium papers. 5. Books 6. Talk on the topic by distinguished doctors and professors. Out of 37 selected literatures 17 are finally selected for review. Standard selection procedure has been followed.

RESULTS: Though the neurosurgical procedures are more sensitive to SSIs, reported SSI at neurosurgical site, low compared to general SSIs if we follow the standard protocols to prevent SSIs, there is decrement up ranges from 20% to 35% in neurosurgical SSIs.

INTRODUCTION:

Surgical site infections are classified by the centre of Disease Control (CDC), USA into a (a) superficial incisional SSI (b) deep incisional SSI and (c) organ / space SSI.

Post-operative surgical site infections in Neurosurgery have high morbidity and mortality. It is about 2% in developing countries. Presentation of surgical site infections (SSI) is prime consideration. Especially neurosurgical procedures, given the grave implications of transgressing the central nervous system. May results in delay in initiating adjuvant therapy. Also can be results in fatal intracranial infection. But it can be prevent by following all protocol. Current practice focuses on antibiotic prophylaxis. This myth needs to be change.

Besides of physical examination, other diagnostic tools used to detect infection are 1. Blood culture 2. C-reactive protein 3. Erythrocyte sedimentation rate. 4. Imaging 5. White blood cell count 6. Inflammatory biomarkers. Authors noted that gram negative infection was common in early infection was common in early infections.⁴

In 1992, the Indian Academy of Neurology was borne, after that Indian society for stereotactic and functional Neurosurgery, Neurotrauma society of India.⁶ Now many younger neurosurgeons to start publishing but no sufficient literature is available. Author try hard to find to enough literature.

Primary target to implement all recommendations and protocols are for surgical team, surgeons, nurses, technical support staff and anaesthetists. Sterilisation unit staff and medical store keeper are also involved.

DISCUSSION:

Prevention of SSI needs multidisciplinary as well as epidemiologist (speciality) approach. For the special training, seminars, conferences, workshops and training camps are also very helpful. First step to wards to presentation of SSI is assessing for risk.

Identifying those patients at high risk for SSI we have several tool, web-based surgical risk calculator and clinical examination by physician for fitness certificate are most popular in India.

There is the literature available for additional risk factor for neurosurgical procedure.

Probability factors of Neurological SSI

Patient Factor	Hospital Factor	Home Factor
Alder age, physical fitness, current smoker, drinking alcohol. Diabetes mellitus renal failure, immunosuppressant.	<ul style="list-style-type: none"> Pre operative bath and shaving Site severance or site incision Poor care of wound Foreign bodies at surgical site. Duration of operation Insertion of surgical drain. 	<ul style="list-style-type: none"> Discontinuity of drugs. Non-hygienic staying site. Poor care of wound Irregular dressing Violation of Doctor's instruction Self medication hypertension

SUGGESTIONS:

1. alcohol-based hand rub can be used which decreases SSI rate by (0.8%).¹
2. the incidence of SSI in developing country like India is higher than that in the developed countries.² So extra care needed.
3. It is clear that, the true rate of SSI is likely under estimated in India. There is a provision to submit data online but question is of implementation.
4. The amount of Alcohol-based hand rub can be used which decreases SSI but might not be sufficient to interrupt the chain of contamination of the micro-organisms.
5. Only few studies have been performed within Neurosurgery patients most of the studies were carried out the in intensive care unit of general surgery departments.³
6. The numerous factors are involved to SSI in Neurosurgery. Focus should be on 'never event.'
7. Post-neurosurgical meningitis (PUM) is a severe disease. Diagnostic and the therapeutic approaches based on personal experience.
8. Surgical site infection after craniotomies is serious complication. The incidence is quite variable between 0 and 9.0%. the prophylactic antibiotic protocol suggested.⁷
9. Patients to bathe or shower with plain or antimicrobial soap may be used. Topical body shower (near and on surgical site) with antiseptic chlorhexidine solution is recommended pre-operatively.⁷
10. Results of the SSI perpetuation factors must be review time to time.⁸

11. Proper hand hygiene and OT hygiene is the important factor in SSI development.
12. Suitable antibiotic prophylaxis is highly recommended.
13. Refer to a tissue viability nurse for advice on appropriate dressing and closely observed.
14. External ventricular drain-related infection cannot ignore in neurosurgical patients.
15. Endoscopic third ventriculostomy (ETV) has of the most common and important neuroendoscopic procedure. ETV has a rich history and renewed interest. Recues SSI with extra Care.
16. Neurosurgical SSIs at paediatric department are particularly devastating successful. Collaboration between clinical staff and patients (their families) for preoperative standardized protocol alone reduces SSIs rates.¹⁰
17. Infections of brains are rare in developed countries but always serious.
18. 20% (approximate) of SSI the origin of central nervous system (CNS) remains unknown.¹²
19. Wound or cerebrospinal fluid leak is major reason for SSI which increases 24.4 fold in this case requires, reoperation.¹³
20. Use of unsafe or less safe instrumentation doubled the risk of reoperation.¹³
21. The use of surgical non-suction drain reduces the risk of SSJ. (Ho et al 2007)
22. Cranial surgery without hair removal is safe and does not increase the risk of surgical site wound infection.¹⁴
23. SSI incidence at neurosurgery site in the developing countries is higher than then developed country.¹⁵
24. Patients with TBI or Malignancy is independent risk factor for SSIs.¹⁶
25. In spinal an cranial surgery might be protective against deep SSIs by using vancomycin powder.¹⁷

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