



Evaluation of clinical pathway implementation and clinical practice guidelines in the management of deep neck abscess (DNA) at Dr. Sardjito, General Hospital Yogyakarta, Indonesia

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ABSTRACT

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Deep neck abscess (DNA) is an infectious condition categorized as an emergency case with high mortality and morbidity. The incidence decreases over time due to extensive use of antibiotics, operative intervention, and improved awareness of dental hygiene. Management of DNA must be carried out appropriately and efficiently to prevent complications that may occur, such as jugular vein thrombosis, pericarditis, and pneumonia. Patients with DNA are often categorized as high-cost patients, because of the long duration of hospitalization, the need for special examinations, and complicated management. Clinical practice guidelines (CPG) and clinical pathways (CP) are a standard created for management, quality, and cost control. The study aimed to evaluate the implementation of the CPG and CP in DNA patients at Dr. Sardjito General Hospital, Yogyakarta. The study used medical records data of DNA patients from January 2018 to December 2020 who met the inclusion and exclusion criteria. A total of 55 subjects were obtained, with compliance to complete CPG filling of 98.3% and CP filling of 96.2%. There was 100% completion in CPG filling categorized as good compliance, whilst the number of good compliances for CP was 92.7%. In conclusion, the diagnosis and management of DNA patients at Dr. Sardjito General Hospital has good compliance with CPG and CP available.

ABSTRAK

Abses leher dalam (ALD) merupakan salah satu kondisi infeksi yang dikategorikan dalam kasus emergensi yang bisa menimbulkan kecacatan hingga kematian pasien. Angka kejadian ALD dari waktu ke waktu menurun karena penggunaan antibiotik, intervensi operatif, dan meningkatnya kesadaran masyarakat akan kesehatan gigi. Penanganan ALD harus dilakukan secara tepat dan efisien untuk mencegah komplikasi yang mungkin terjadi dan berujung kematian seperti trombosis vena jugular, perikarditis, dan pneumonia. Pasien ALD sering dikelompokkan dalam pasien dengan biaya perawatan tinggi karena perawatannya yang lama di rumah sakit, memerlukan pemeriksaan khusus dan tata laksana yang rumit. *Clinical practice guidelines* (CPG) dan *clinical pathways* (CP) merupakan standar pelayanan yang dibuat untuk mengendalikan tata laksana, kualitas pelayanan dan biaya pengobatan. Penelitian ini bertujuan untuk mengevaluasi penerapan CPG dan CP pada tatakelola pasien ALD di RSUP Dr. Sardjito Yogyakarta. Penelitian menggunakan data rekam medis pasien dengan diagnosis ALB yang memenuhi kriteria inklusi dan eksklusi periode Januari 2018 hingga Desember 2020. Total 55 subyek penelitian diperoleh dengan kepatuhan dalam pengisian CPG secara lengkap sebanyak 98,3% dan pengisian CP sebanyak 96,2%. Terdapat 100% kelengkapan pengisian CPG dikategorikan dalam kepatuhan baik, sedangkan untuk CP sebanyak 92,7% dikategorikan baik. Sebagai kesimpulan, diagnosis dan tata laksana pasien ALD di RSUP Dr. Sardjito menunjukkan kepatuhan yang baik terhadap CPG dan CP yang tersedia.

Keywords:

deep neck abscess;
clinical practice guideline;
clinical pathway;
laryngology;
compliance

INTRODUCTION

Standard of medical care is a guideline that must be followed by doctors or dentists in implementing the medical practice. There are many kinds of standard of medical care, one of them is standard operating procedure (SOP). Clinical practice guideline (CPG) and clinical pathway (CP) are part of lines in the SOP. It is a standard of medical care that must cover at least the definition, history taking, physical examination, diagnostic criteria, differential diagnosis, supporting examination, therapy, education, prognosis, and literature. The CPG and CP were determined by the health facility management. The arrangement of CPG is based on the most frequent or higher risk or high-cost disease or having wide variations in its management, whereas CP is a multidisciplinary integrated service planning concept that leads health care workers in giving medical services to patients.¹

Every step of CP provided to patients is based on the standard of medical care and it is implemented while they are hospitalized. The goal of the CP are improving patient outcomes, encouraging patient safety, escalating patient satisfaction, and optimizing the utilization of resources. The principle of organizing CP must be focusing on patient care and continuing care, multidisciplinary service, recording the disease course in daily or in hourly form, a part of a medical record, aberration tread called as a variant, and variant happened because of disease course/ comorbidity/ complication/ medical error.²⁻⁴

Deep neck abscess (DNA) is one of the most dangerous infectious diseases that is categorized as an emergency case in the Otolaryngology Head and Neck Department. It can be a greater cause of disability and death in patients.^{5,6} Literally, DNA can be defined as a

collection of pus in the potential space between the deep cervical fascias induced by the spread of infection to the teeth, mouth, throat, paranasal sinuses, ears, neck, and other surrounding structures. Apart from being an abscess, infection in these organs can also manifest in the form of cellulitis or necrotizing fasciitis.⁷⁻⁹ The incidence of this disease declines gradually over time due to the development of effective use of antibiotics, faster decision-making in intervention, and increasing public awareness to maintain dental hygiene, which is the most common etiology of DNA in adults. To prevent complications such as jugular vein thrombosis, pericarditis, and pneumonia the management of DNA must be performed appropriately and efficiently.^{6,10}

The morbidity and mortality rate of DNA is arising. Saboo *et al.*,¹¹ reported that the mortality rate among 101 DNA patients is 0.99% due to cervical necrotizing fasciitis proceeded to myocardial infarct. The morbidity rate was approximately 9.9% with the presence of neck contracture, restricted mouth opening, and reoccurred DNA.¹¹ Furthermore Pineda-Alvarado *et al.*,¹² reported that there is an 8.33% mortality rate among 36 total patients and 13.88% of them were admitted to the intensive care unit. On the other hand, the costs of DNA management were particularly scarce. Hurley *et al.*,¹³ reported that the incurred costs of DNA patients are £421,795.89 for 74 patients and the total cost per patient is £5,699.94 with a range of £332.06 to £46,700.24. This high burden cost was associated with the management of DNA patients because of the solemn nature of the condition.

The cost-effectiveness in the management of DNA for one night in Canadian Healthcare System was \$4629.57.¹⁴ It included hospital admission, surgical intervention, and postoperative ICU admission. In 2020 in Dr. Sardjito General Hospital, the average

burden costs for 6.8 days of inpatients were IDR20,077,172.00. These all studies could be concluded that the case of DNA is classified as high-risk and high-cost disease.

As a national center hospital, Dr. Sardjito General Hospital, Yogyakarta had become a referral destination from other hospitals. The CPG and CP for DNA management in Dr. Sardjito General Hospital, Yogyakarta was made by the Department of Otolaryngology Head and Neck Surgery and it had been approved by a board of management afterward. The DNA is a serious condition that needs hospitalization in management. The diagnosis and treatment of DNA patients require a lot of time and resources. Many supporting examinations were needed, as well as complicated and meticulous management. The complexity of the disease contributed to the high mortality and morbidity rate as well as the high cost of treatment. Therefore, it is necessary to control the quality and cost of DNA management based on evaluating CPG and CP. The study aimed to evaluate the compliance of the management of DNA to CPG and CP in the Dr. Sardjito General Hospital, Yogyakarta.

MATERIALS AND METHODS

Subjects

It was a descriptive study using data from the medical records of patients with DNA at Dr. Sardjito General Hospital, Yogyakarta in the period from January 2018 to December 2020 who met the inclusion and exclusion criteria. The research protocol was approved by the Medical and Health Research Ethics Committee (MHREC) Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada/Dr. Sardjito General Hospital, Yogyakarta (ref. no. KE/FK/0236/EC/2021). The inclusion criteria of this study were all

DNA patients treated at the Department of Otolaryngology Head and Neck Surgery, Dr. Sardjito General Hospital, Yogyakarta. The exclusion criteria in this study were DNA patients who does not follow treatment to completion.

Procedure

The points that we measured in CPG were history taking (localized pain, globus pharyngeus, halitosis, trismus, fever, fatigue, toothache, history of toothache or hypertrophy tonsils), clinical findings (swelling in the head / neck / submandibular / submental, skin hyperemic, tenderness), supporting examination (bacterial culture, multislice computed tomography, orthopantomography, laboratory examination), diagnosis and differential diagnosis, management (pharmacotherapy and surgery), education, prognosis, clinical indicator after surgery, and condition for being outpatient.

There were sixteen points measured in CP such as initial assessment, laboratory examination, imaging, consultation, further assessment, diagnosis and differential diagnosis, discharge planning, education, pharmacotherapy management, intervention, monitoring and evaluating, rehabilitation, outcome, criteria for being outpatient, and patient/family education. It must be fulfilled and done by health workers including doctors, nurses, pharmacists, and nutritionists.

Data analysis

Data from the medical records were collected, tabulated as frequency and then descriptively analyzed.

RESULTS

A total of 55 subjects who fulfilled inclusion and exclusion criteria were

involved in this study. The average compliance with the CPG and CP were 98.3% and 96.2%, respectively. From total 55 samples in CPG's, all considered having good compliance (100%), while

on CP compliance, 51 samples (92.7 %) were categorized as good compliance, and 4 samples (7.84 %) were categorized as moderate compliance (TABLE 1).

TABLE 1. Compliance with CPG and CP

Compliance	CPG (n=55)	CP (n=55)
Compliance with CPG/CP (%)	98.3	96.2
Compliance category (%)		
• Good compliance (>85)	55	51
• Moderate compliance (51-84)	0	4
• Low compliance (10-50)	0	0

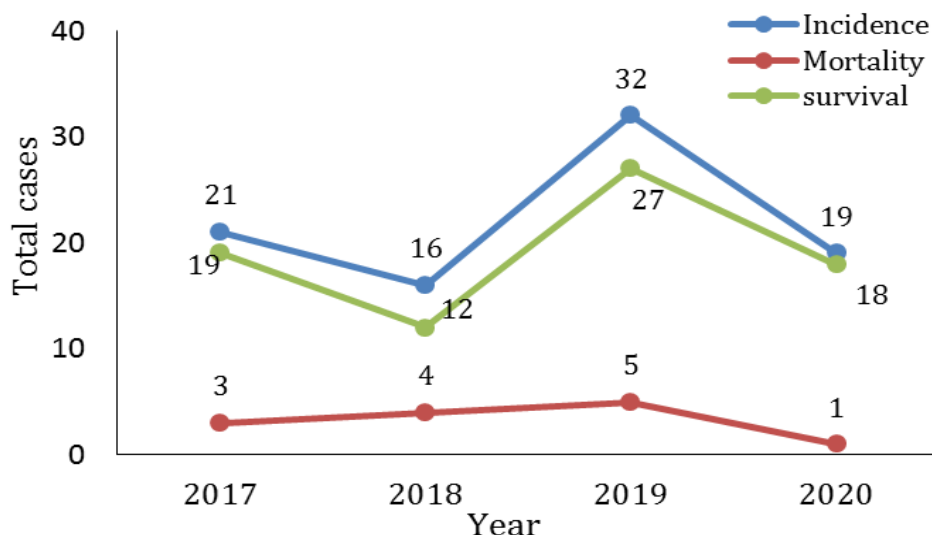


FIGURE 1. Incidence, mortality, and survival rate of DNA from 2017 to 2020

Incidence, mortality, and survival of DNA patients at Dr. Sardjito General Hospital, Yogyakarta treated at the Department of Otolaryngology Head and Neck Surgery from 2017 to 2020 was presented in FIGURE 1. In 2017, there were 21 new cases with a death rate of 3 subjects with a mortality percentage of 14.3%. In 2018, there was a decrease in the number of cases to 16 cases, with 4 death cases (25% mortality rate). In

2019, there was a rise in cases to 32 cases and 5 cases of death with a mortality percentage of 15%. In 2020, there were 19 new patients, and a mortality rate was one patient with a mortality percentage of 5%. Since DNA cases were not abundant, and often vary in severity and seasons, the lower the number of cases and the more severe the cases, the higher the mortality rate.

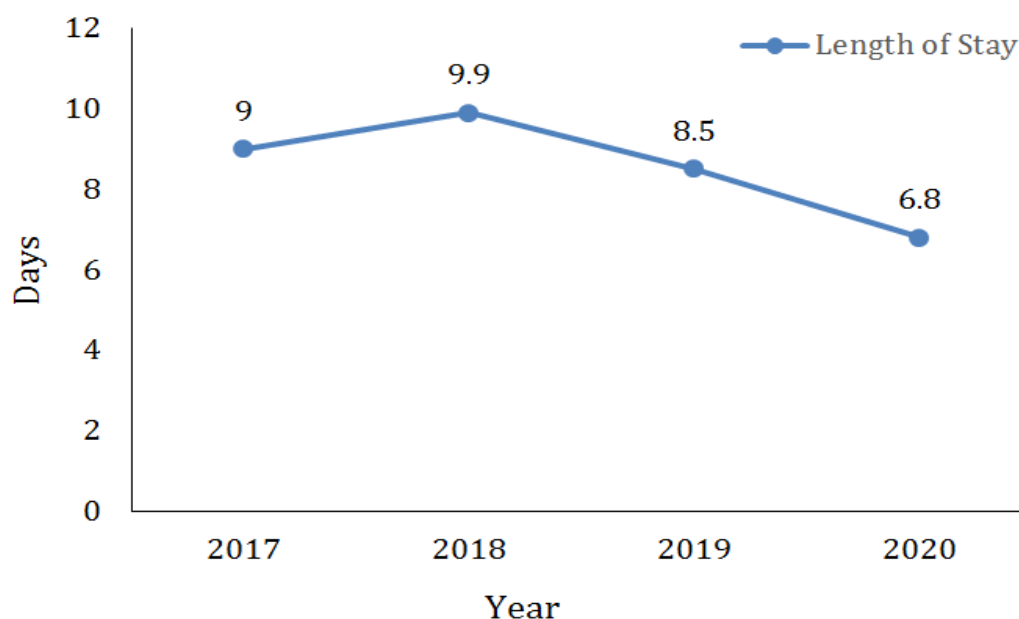


FIGURE 2. Average length of stay (LoS) patients with DNA from 2017 to 2020deep

FIGURE 2 illustrates the LoS of DNA patients each year from 2017 to 2020. In 2017, the average LoS for DNA patients was 9 days, in 2018 it was 9.1 days. In 2019, LoS of DNA patients are 8.5 days and in 2020 they are 6.8 days. This showed that the LoS had decreased in the last 4 years, which indicates the improvement of DNA management.

DISCUSSION

The compliance with the CPG and CP were 98.3% and 96.2%, respectively (TABLE 1). Based on the All-Wales Fundamentals of Care Audit, compliance with standard care is categorized into 3 categories, there were low compliance (10-50%), moderate compliance (51-84%), and good compliance (>85%).¹⁵ In this study, the compliance to both CPG and CP in the management of DNA was considered good compliance in 55 (100%) and 51 (92.7%) from each of the total samples. In the CP group, 4 samples were included in the moderate compliance category (TABLE 1). It can be concluded that the service to patients based on CP and CPG in Dr. Sardjito General Hospital, Yogyakarta has shown good average compliance.¹⁵ It showed

that the implementation of services for DNA patients from diagnosis to treatment has been suitable with CP and CPG guidelines.

The investigation of the compliance with the CPG and CP in the management of DNA patients in medical services and practices in Indonesia is limited. Therefore, the data exhibiting the standard service for DNA patients is limited. Several studies to evaluate the compliance with CPG dan CP in the management of different diseases were reported. Mahmudin *et al.*¹⁶ reported that the high compliance of CP in the management mastectomy is 39.5%, whereas the low compliance is 60.5%. Sari and Sundari¹⁷ reported that the compliance with the CP in the management of hypertension is 28.57%. In other study, He *et al.*¹⁸ reported the compliance with CP for five common diseases i.e. community-acquired pneumonia, acute myocardial infarction (AMI), heart failure, cesarean section, and type-2 diabetes at inpatients care in general hospital in China ranges from 61 to 89%.

In this study, the compliance with the CP in management of DNA patients were found 92.7% and considered

as a good category. It means that the diagnosis and management of DNA patients at the Dr. Sardjito General Hospital, Yogyakarta has been already in good compliance. Implementation of the CP for DNA patients at the Department of Otolaryngology Head and Neck Surgery, Dr. Sardjito General Hospital has begun since the end of 2018. This implementation could aid health workers to serve patients with applicable regulations or standards. Therefore, it is used to improve service quality and prevent unnecessary variations in treatment.¹⁹

The implementation of CP in DNA patients may contribute in the decrease of the mortality rate and the improvement of LoS. The mortality rate of DNA patients at Dr. Sardjito General Hospital, Yogyakarta shows a decrease in the last three years, with the percentage of death from 25% in 2018 to 15% of cases in 2019 and continuing to decline to 5% of cases in 2020 (FIGURE 1). Furthermore, the LoS decreased from 9.9 days in 2018 to 8.5 days in 2019, and continued to decline to 6.6 days in 2020. The decreases in mortality and LoS rates is in line to compliance with CP and CPG of DNA patients, which have good scores with 98.3% in CPG and 96.2% in CP.

CONCLUSION

The diagnosis and management of DNA patients at Dr. Sardjito General Hospital have good compliance with the CPG and CP. The decrease of mortality rate and LoS of the DNA patients are associated with the good compliance with CPG and CP.

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