



EVALUATION OF SERUM CHOLESTEROL LEVELS AS RISK FACTORS FOR DEVELOPING SURGICAL SITE INFECTION FOLLOWING ELECTIVE SURGERY

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Abstract

The study shows detailed research study of cholesterol is a crucial component of the cell membranes, and it plays a significant role in resistant cell signaling as well as cell activation. This study paper also discusses that high or increased cholesterol levels can hinder this process and make it more challenging for the immune system to react to invading pathogens. It is important to maintain low and healthy cholesterol levels with the help of proper diet plans, and exercise can give additional benefits in decreasing the risk factors of surgical infections and any other types of complications.

Keywords: Serum cholesterol, Surgical site infection, Infection control, Postoperative care for serum cholesterol, Elective surgery

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1. Introduction

Patients with high cholesterol levels are more probable to develop surgical site infections than those with normal levels. It has been observed that patients who have more than 200 mg/dL of cholesterol level, are more likely to create surgical site infections after colorectal surgery [1]. The increased cholesterol level can decrease the immunity system and reduce the ability to fight off

infections. Thus, it is noteworthy that there is an inconsistent relationship between cholesterol levels and surgical site infection. Furthermore, many other factors like diabetes, obesity, age and smoking are also linked with surgical infections and it can be hard to separate the impacts of cholesterol levels from all these factors.

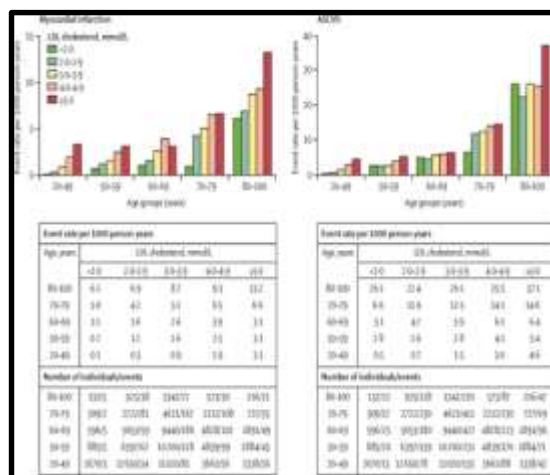


Figure 1: Serum cholesterol levels related risk factors

Therefore, it can be deduced that several pieces of evidence are there which show that the increased cholesterol level can be a risk factor for surgical site infections [2]. Elective surgery needs to be more advanced to better understand the connection between cholesterol level and surgical site infection.

Objectives

- To critically analyze the effectiveness of the serum cholesterol levels in surgical site infection.

- To evaluate the impact of increased cholesterol levels in surgical site infection
- To discuss the serum cholesterol levels related to risk factors for developing surgical site infection
- To measure the importance of estimating serum cholesterol levels
- To assess the relationship between serum level and cholesterol level in surgical site infection
- To highlight the methods that are important for the estimation of serum cholesterol levels

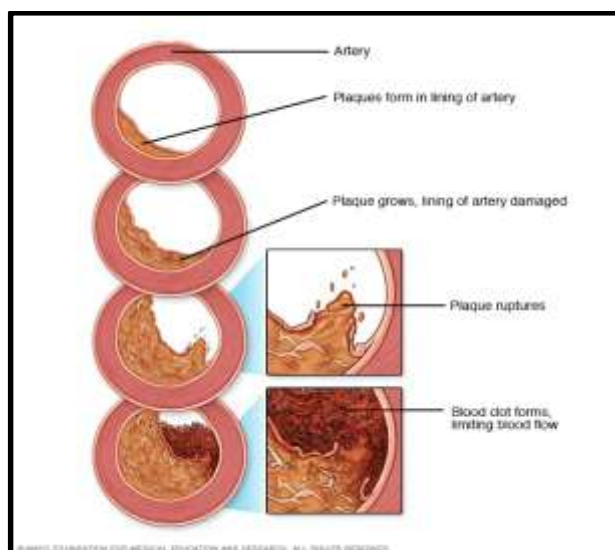


Figure 2: Effects of increased Serum cholesterol levels

2. Methodology

Serum cholesterol concentrations less than 160 mg/dl indicate an increased incidence of surgical site infections. It has been observed that a test of serum cholesterol level can help to identify the risk of fatty deposits in human arteries that can lead to surgical site infection or blocked arteries throughout the body [3]. In this research paper, a thematic analysis has been used thematic analysis and secondary qualitative research has been used to identify the effects of increased cholesterol levels in the human body or developing post-surgery infections.

Serum Cholesterol

Increased serum cholesterol levels, can have several problems and negative impacts on the body such as a high risk of cardiovascular illness or disorder, impaired blood flow, high risk of peripheral artery infection, pancreatitis, high risk of gallstones, Xanthomas, and cognitive deterioration. Increased serum cholesterol levels can contribute to the growth of atherosclerosis, a condition in which plaque increased inside the arteries and reduces them and make them harden [4].

Cholesterol Level	SSI (Surgical Site Infection)		Total
	Present(%)	Absent(%)	
Hypo-cholesterolemia	28 (41.8)	39 (58.2)	67
Normal	15 (10.5)	128 (89.5)	143
Hyper-cholesterolemia	03 (7.9)	35 (92.1)	38

Figure 3: Role of serum cholesterol in surgical site infection

This can cause a high risk of heart disease or heart attack, stroke, and many other cardiovascular disorders.

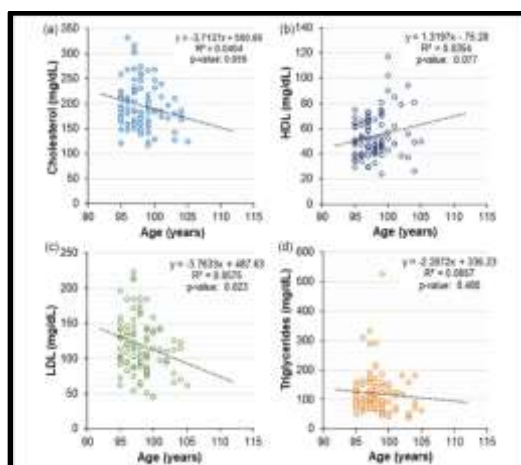


Figure 5: Scatter plot of cholesterol levels vs age

This above scatter diagram or scatter plot indicates four things, scatter plot of cholesterol levels vs age which shows a slight negative connection between cholesterol and age, high-density lipoprotein vs age which shows a positive correlation with age, low-density lipoprotein vs age which directs correlation between LDL and age and total triglyceride vs age which illustrates a correlation between total triglyceride and age. Along with this, high levels of serum cholesterol can reduce and harden the vessels of blood, reducing the blood flow in the body parts, including the heart, brain, and other parts. Besides this, increased cholesterol levels can

cause gallstones, fatty deposits under the skin, increased risk of cognitive decline, and Alzheimer's disease [5]. Therefore, it can be deduced that cholesterol levels can be reduced only by lifestyle changes like proper exercise, good diet plans, and proper medications.

Surgical Site Infection Due To Increased Cholesterol Level

A surgical site infection or SSI is a serious infection that can occur after any critical surgery at the site of the surgical incision. Surgical area infection can be caused by any bacteria or any

other micro-organisms that move into the body at the time or during surgery or as a form of contamination after an operation [6]. There are several common risk factors that are associated with surgical site infection, extended surgery time,

inadequate surgical technique or poor hygiene, pre-existing health conditions such as diabetes, obesity, excess use of immunosuppressive medicines, and wrong wound care after surgery.

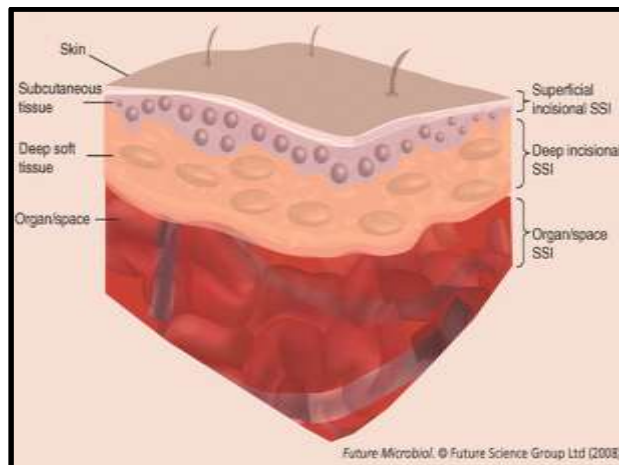


Figure 6: Surgical site infection

The symptoms of surgical site infection include swelling, warmth, redness, body pain, infections or drainage at the surgical area [7]. It has been observed that, in several cases, the infections can spread to other body parts and can cause fever, fatigue and many other problems. Prevention of these surgical infections includes effective surgical techniques as well as proper hygiene, and also it is important to ensure that the surgical instruments are correctly sterilized and to manage other health factors like diabetes and obesity before any kind of

surgery. Along with this, right wound care after surgery is also essential to prevent surgical infections.

Postoperative Care for Serum Cholesterol

It is essential to take postoperative care can control high serum cholesterol for preventing its negative influences on the body. It is important to maintain a healthy lifestyle and healthy diet which includes high fruits, whole grains, and large proteins [8].

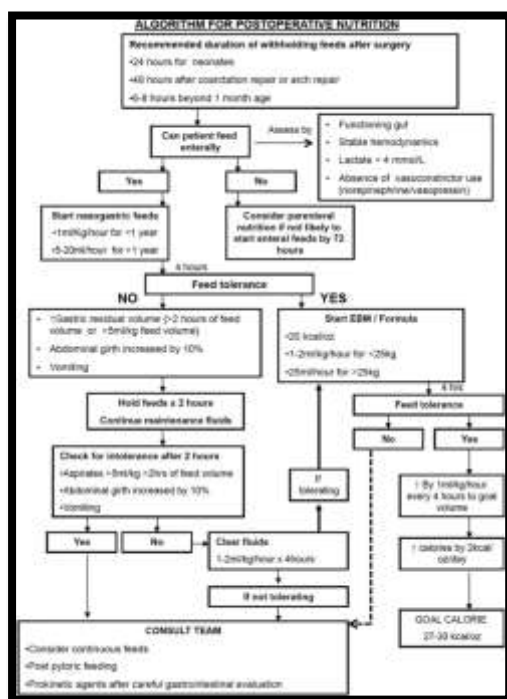


Figure 7: Nutritional management for cholesterol control

Mainstream Atherothrombosis Theory

The mainstream atherothrombosis theory provides the idea that that increased cholesterol levels in the blood can increase the formation of plaques in the arteries of the body. Over time, these plaques become narrow, hardened and decrease the size of arteries which causes atherosclerosis [11]. This issue of atherosclerosis can increase the chances of heart disease and stroke, and decrease blood flow. Along with this, this theory stated that when a plaque ruptures, it can create blood clots in the brain, can cause atherosclerosis and heart attacks or strokes, affects cell membranes, and hinder different functions in the body [12]. Therefore,

high cholesterol levels and their complications can be controlled by lifestyle changes.

This healthy meal plan can help to lower the level of serum cholesterol levels. Along with this, regular exercise for improving the levels of cholesterol and entire cardiovascular health. It has been observed that smoking can increase high risk of cardiovascular disease and increased cholesterol levels. Quitting smoking can improve overall health as well as cholesterol levels. Other than this, follow-up appointments after a critical surgery can help to monitor cholesterol levels [10]. Therefore, it can be deduced that with the help of these postoperative care strategies, cholesterol levels and post-surgery risk can be reduced

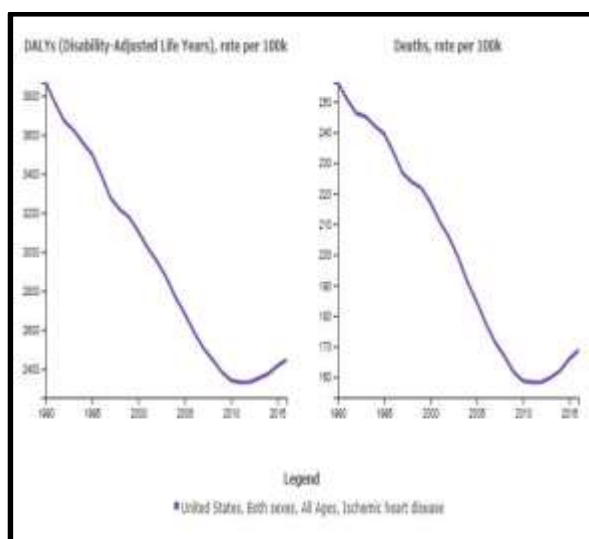


Figure 8: Mainstream atherothrombosis theory

(Source: 9)

Problem Statement

Elevated cholesterol levels can play a great role in the growth of surgical site infections and it can also lead to impaired immune function, increased inflammation, and impaired blood flow. Increased cholesterol levels can hinder or weaken the immunity system as well as the ability to fight against infections [13]. Along with this, increased cholesterol levels make the body more susceptible to any type of infection such as surgical site infections. On the other hand, high cholesterol levels can cause chronic inflammation which can deface wound healing and grow the chances of surgical infections. Along with this increased cholesterol levels can reduce and harden the blood vessels, and decrease the blood flow to the surgical site. However, this can weaken wound healing as well as increase the high chances of infection. For reducing the risk of these infections with high cholesterol levels, it is essential to lead a healthy lifestyle which includes a balanced diet, daily exercise and medication. Besides this, it is also important to maintain proper hygiene as well as

proper care before and after any surgery to decrease the risk of any kind of surgical infection. Also, many other interventions can help to reduce cholesterol levels [14]. Therefore, it can be deduced that identifying the risk factors for surgical site infections can help healthcare providers build effective strategies to decrease the incidence of surgical infections and improve patients' health.

3. Conclusion

From the overall study, it can be concluded that high cholesterol can cause several infections after critical surgery. However, this can weaken wound healing as well as increase the high chances of infection. To reduce the risk of these infections with high cholesterol levels, it is essential to lead a healthy lifestyle which includes a balanced diet, daily exercise and medication. Besides this, it is also important to maintain proper hygiene as well as proper care before and after any surgery to decrease the risk of any kind of surgical infection. Also, many other interventions can help to reduce

cholesterol levels. Therefore, it can be deduced that identifying the risk factors for surgical site infections can help healthcare providers to build effective strategies to decrease the incidence of surgical infections and improve patients' health.

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