Journal of Developing Country Studies ISSN (number) (online)
Vol.(number), Issue (number), pp 1 -17, 2024

Rituximab in Reducing Postoperative Wound Complications in Systemic Lupus Erythematosus Patients

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Article History
Received (date)
Received in Revised Form (date)
Accepted (date)

How to cite in APA format:

Author name (2024). Commentary: Antibiotic Resistance, Sustainable Development 2030 and Poverty in Developing Countries. Journal of Developing Country Studies, vol(issue), page. Link

Abstract

An unresolved origin underlies the persistent multisystem disease known as systemic lupus erythematosus. The condition manifests itself in a variety of ways, but its hallmarks are connective tissue inflammation and the presence of antinuclear self-antibodies especially double-stranded anti-DNA antibodies (Chan et al., 1999). Left untreated, it can progress to a catastrophic stage. By stimulating immune cell induction through type III and type II sensitivity and antibody-dependent cytotoxicity, autoantibody synthesis played a role in the etiology of SLE. Deposition of antibodies may signal innate immune cells to produce cytokines including interleukin, tumor necrosis factors, and interferon alpha (Chan et al., 1999).

In SLE, B-cell involvement in disease activity is a basic immunological feature. When these types of cells were deleted from "lupus models" in mice either gene editing or antibody treatment, the immunological reaction chain, including T-cell-induced abnormalities, was significantly inhibited, according to the experiments (Cranney & Adachi, 2002). In addition to secreting cytokines like IL-4 and IL-10, B-cells can control the activity of other cell types, such as T-cells, dendritic cells, and other B-cells. Even though the exact role of
B-lymphocytes in SLE is still unclear, their contribution to the immunopathogenesis of the disease is well established (Edwards et al., 2004).

Key points: Ritumab, systemic lupus erythematosus

INTRODUCTION

Because Systemic Lupus Erythematosus is a chronic inflammatory disease, it is hard to treat surgically. Patients, primarily women of childbearing age, have problems with their immune systems that attack safe tissues. This causes a wide range of symptoms that affect many organs (Vital et al., 2011). Surgical treatments need to be carefully thought out because of things like immunosuppression from medicines used to treat the disease, which makes the person more likely to get an infection after surgery.

Systemic Lupus Erythematosus-related vasculopathy also raises the risk of problems during surgery, such as bleeding or blood clot formation. Long-term use of corticosteroids every day in treating Systemic Lupus Erythematosus is also a cause for worry because it can weaken tissues and make it harder for wounds to heal. To get the best surgery results for people with Systemic Lupus Erythematosus, it is essential to understand these issues thoroughly. This introduction discusses Systemic Lupus Erythematosus, what to think about when having surgery, problems that can happen after surgery for people with Systemic Lupus Erythematosus, and how Rituximab might help reduce these problems.

Systemic Lupus Erythematosus people who have surgery are apprehensive about wound complications after the surgery. These problems not only make healing take longer, but they also raise the cost of health care and could cause more significant issues. Because systemic lupus erythematosus is so complicated and affects many organs and the immune system, it takes a broad approach to understand and treat wound-related problems in these people. In this discussion, we look at the most common wound problems seen in people with Systemic Lupus Erythematosus after surgery and figure out what causes these problems.

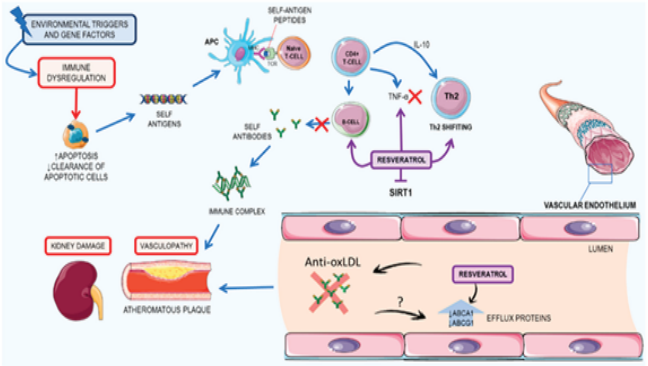


Figure 1: Pathogenesis of systemic lupus erythematosus (SLE) and resveratrol mechanisms of action. ne of the main worries for people with Systemic Lupus Erythematosus who need surgery is that they are more likely to get wound infections. The immune system is weakened by Systemic Lupus Erythematosus, which is made worse by the medicines used to treat it. This makes it harder for the body to fight off pathogens, which raises the risk of getting an illness after surgery. When these infections appear at the surgical site, they can affect the top layers of skin (superficial wound infected) and the lower tissues (deep wound infection). When you have a simple wound infection, the area will probably be red, warm, swollen, and painful. On the other hand, a deep wound infection can affect

In addition, systemic lupus erythematosus-related vasculopathy makes it harder to treat wounds after surgery. Vasculopathy, which is inflammation and damage to blood vessels, can make it hard for blood to get to the surgery site, which can cause tissue ischemia and slow the healing of the wound. People with systemic lupus erythematosus may be more likely to get seromas, hematomas, and buildups of blood or fluid at the surgical site. This is because their vascular reaction may not work correctly. Seromas and hematomas not only slow down wound healing but also raise the risk of illness and other problems, so they must be found quickly and drained when necessary. Vasculopathy may also make the risk of bleeding after surgery higher, so it is essential to carefully stop the bleeding during surgery and keep an eye on the patient
afterward.

IThe monoclonal antibody rituximab targets CD20-positive B cells and gets rid of them through antibody-dependent and complement-mediated death cytotoxicity. It is often used to treat B-cell cancers and inflammatory diseases, such as Systemic Lupus Erythematosus. Rituximab has become a promising treatment choice for people with Systemic Lupus Erythematosus who have a disease that doesn't respond to or isn't tolerant of standard immunosuppressant drugs. By going after B cells, Rituximab stops the production of autoantibodies, lowers the release of inflammatory cytokines, and changes immune responses. This reduces the disease activity and improves patient results. Additionally, new evidence shows that Rituximab may help wounds heal and improve outcomes after surgery in people with Systemic Lupus Erythematosus. Rituximab may lower the chance of wound complications after surgery and improve surgical outcomes in this group by reducing systemic inflammation, restoring immune homeostasis, and encouraging tissue repair mechanisms.

LITERATURE REVIEW

Rituximab, sold under the brand Rituxan or MabThera, was one of the first examples of targeted treatment in immunology. In the 1980s, scientists found a specific protein (CD20) on the surface of B cells that led to the start of its growth. B cells are a kind of white blood cell that make antibodies. Antibodies are essential for the defense system. When someone has an autoimmune disease like systemic lupus erythematosus, their B cells can cause too many antibodies, which attack healthy organs. Rituximab reduces the number of B cells by addressing the CD20

protein. This stops the immune system from reacting too strongly. It was first tested on people with non-Hodgkin's Lymphoma, a type of cancer that affects the lymphatic system, in the 1990s. Because these tests went well, the US Food and Drug Administration (FDA) approved it in 1997 for this particular type of cancer. Rituximab has been cleared since then for several autoimmune diseases, such as Systemic Lupus Erythematosus and Rheumatoid Arthritis.

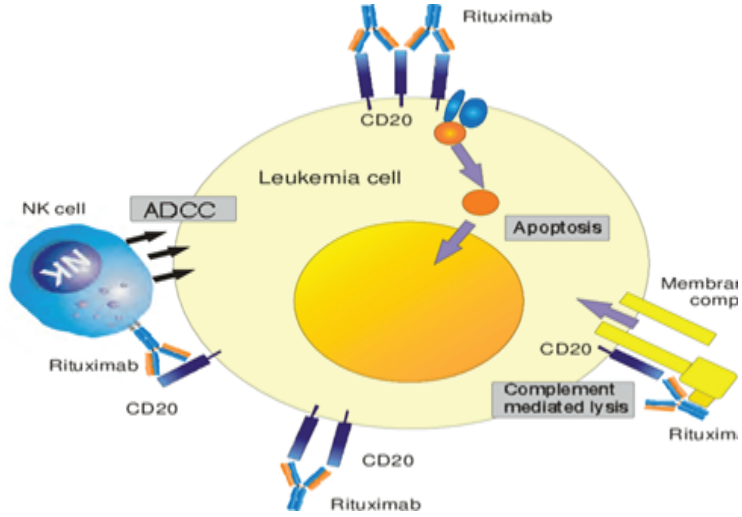


Figure 2: Mechanism of action of rituximab

Rituximab is a monoclonal antibody that targets the CD20 protein on B cells and has changed how many autoimmune diseases and B-cell cancers are treated. It works through a complicated set of steps that eventually destroy B cells, which changes the immune response. For a better look at the way Rituximab does this, read on:

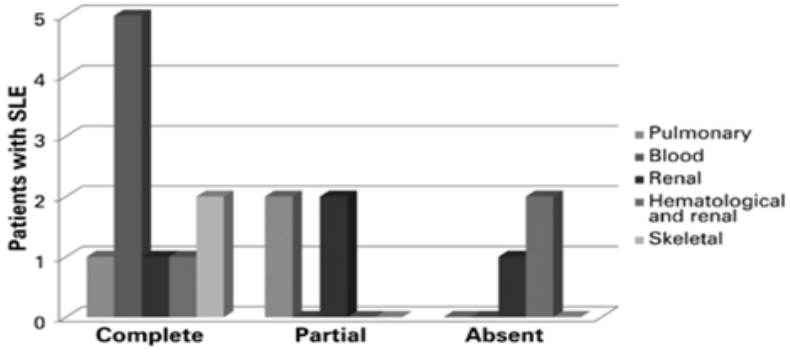
Rituximab is designed to spot and bind to the CD20 protein, which resides primarily on the surface of B cells. Immediately after being given, Rituximab moves through the bloodstream and binds to B cells that produce CD20. This focused binding is critical because it ensures its action is specific and doesn't hurt other types of cells. When Rituximab binds to B cells that express CD20, it sets off a chain of immune reactions. One substantial effect is the activation of macrophages, a resistant cell type that can clean up debris. These macrophages are drawn to the Rituximab-marked B cells because they know they must be killed.

The macrophages brought in eat the B cells attached to Rituximab and kill them. This process successfully gets rid of a large number of B cells that are floating around in the blood. As the number of B cells decreases, the production of antibodies by these cells also decreases, which weakens the immune reaction. Rituximab stops the immune system from attacking itself and assists in controlling the disease action by getting rid of B cells. Rituximab quickly and deeply kills off B cells, but this action doesn't last forever. The bone marrow constantly makes new B cells to keep the immune system working. After taking Rituximab, the number of B cells in the blood slowly decreases until they hit their lowest point within a few weeks. But B cell numbers start to rise again after some time, usually between a few months and a year. In the end, B cell counts return to almost normal levels because new cells are made in the bone marrow, increasing the number of B cells in the blood.

METHODOLOGY

Research indicates that there have been successful case reports of treating systemic lupus erythematosus with Rituximab. Several recent studies have shown that Rituximab effectively treats symptoms of systemic lupus erythematosus throughout the body. This includes arthritis, serositis, Nephritis, hemolytic anemia, and thrombocytopenia, as well as improving serum parameters and indicators of disease activity. As a result, patients may be able to reduce or stop using immunosuppressants like corticosteroids. Although there are currently no agreed-upon regimens for dosages and applications, the method first proposed by Machado et al. (2014) for rheumatoid arthritis is the one most commonly utilized in clinical practice. Using extremely sensitive flow cytometry to evaluate these patients, Vital et al. (2011) found that Rituximab was effective in Systemic Lupus Erythematosus with a correlation between B-cell count and clinical response; B-lymphocyte depletion and repopulation were predictive outcome variables. The study included 39 patients.

According to the study, patients with renal impairment did not show significant clinical improvement following Rituximab treatment (Machado et al. 2014). A study by Vollenhoven et al. (2004) showed that two patients with lupus Nephritis who were resistant to cyclophosphamide and had received Rituximab improved histological activity. Leandro et al. (2002) reported similar findings describing a reference service's experience with Rituximab in six patients with systemic lupus erythematosus and Nephritis who had not responded to conventional treatment. Five of these patients had positive outcomes. There may be a substantial improvement in hematologic involvement in instances of Systemic Lupus Erythematosus treated with Rituximab, as the decrease of B-lymphocytes may interfere with the generation of pathogenic antibodies against erythrocyte and platelet antigens. Numerous writers have proved this effectiveness. Take Landeiro et al. (2005) as an example; they detailed how Rituximab helped every single patient who had autoimmune cytopenia in their research. Rituximab also produced a positive complete response in the five patients with hematological symptoms in the trial by (Machado et al. 2014).



SLE: systemic lupus erythematosus; RTX: rituximab.

FINDINGS

Figure 1 Clinical response to the use of rituximab in patients with systemic lupus erythematosus, according to the affected organ/system

The successful use of Rituximab in treating systemic lupus erythematosus is controversial, as shown by randomized studies that consistently fail to demonstrate better outcomes despite positive clinical data. Merrill et al. (2010) found no significant differences between Rituximab and placebo in 257 patients, but it was favorable in Afro-American and Hispanic categories. Rituximab showed similar safety to placebo. Rovin et al. found that Rituximab reduced anti-dsDNA and C3/C4 levels in lupus nephritis patients acquiring mycophenolate and corticosteroids, but no clinical improvement was seen after one year. Rituximab with mycophenolate and corticosteroids did not present new safety concerns or results. A survey by (Machado et al. 2014) found substantial proteinuria, serum albumin, and protein/creatinuria ratio reductions in 164 lupus nephritis patients administered Rituximab, particularly in type III patients. Nephrotic syndrome and kidney failure at Rituximab treatment indicated worse response rates. Despite these encouraging results, (Scheinberg, 2006) notes a discrepancy between randomized research and clinical practice, suggesting that study design limitations like heterogeneity in Systemic Lupus Erythematosus display and exclusion criteria of severe symptoms may obscure Rituximab's true efficacy in systemic lupus erythematosus treatment, requiring further investigation and protocol refinement.

DISCUSSION

Systemic Lupus Erythematosus people have a hard time with surgery because the disease affects many parts of the body, and autoimmunity and wound recovery are complicated. This weakness shows up as different wound problems after surgery, calling for a more complex way of managing and caring for patients before and after surgery. Understanding the specific kinds of issues that can happen is essential for ensuring that surgery goes well for people with systemic lupus erythematosus.

Types of postoperative wound complications in Systemic Lupus Erythematosus patients

Surgical Site Infections

Surgical site infections are one of the most common problems that happen after surgery in people with systemic lupus erythematosus. These infections can be as mild as a sore on the skin or as severe as an infection in deeper tissues. They can be very dangerous and take a long time to heal from. The underlying immunosuppression and dysregulated immune reactions in people with systemic lupus erythematosus make them more likely to get infections. Some signs of an SSI are swelling, redness, warmth, pain, purulent flow, and fever. Systemic lupus erythematosus individuals who get surgical site infections need a diverse approach to care. They need to be quickly identified, given the right antibiotics, and, if necessary, surgery to stop more problems and improve outcomes**.**

Delayed Wound Healing

Systemic Lupus Erythematosus people who are having surgery often worry that their wounds won't heal properly. People with systemic lupus erythematosus have immune reactions and inflammatory pathways that are not working correctly. This can slow down the healing process and make an infection more likely to happen. People with systemic lupus erythematosus may have wounds that don't heal correctly if they keep dehiscing, don't make granulation tissue, or have slow epithelialization. To get Systemic Lupus Erythematosus patients' wounds to heal faster, you need a complete wound care plan that includes careful surgical technique, improving systemic factors that slow healing, and close surveillance for signs of illness or wound dehiscence.

Seromas and Hematomas

Fluid collections, like seromas and hematomas, can form at the surgical site in people with systemic lupus erythematosus, which makes it harder for the cut to heal and the person to get better. Seromas, which are made up of serous fluid buildups, and hematomas, which are made up of blood collection, can worsen pain and swelling and lead to problems like infection or slower wound healing. According to the extent of the condition and clinical presentation, seromas and hematomas may be treated with conservative methods like compression bandages or aspiration/drainage treatments in people with systemic lupus erythematosus.

Wound Dehiscence**.**

Wound dehiscence, which is when part or all of a medical incision comes apart, is a big problem for people with systemic lupus erythematosus who are having surgery. Some of the things that can cause a cut to die in people with systemic lupus erythematosus are slow wound healing, weak tissues, and systemic symptoms of the disease like vasculitis or lupus nephritis. To keep systemic lupus erythematosus patients' wounds from dehiscence, surgeons must be cautious, pay close attention to how the wounds are closed, and make the most of things that may affect healing during surgery. Systemic Lupus Erythematosus patients must quickly recognize and treat wound dehiscence to avoid problems and speed up healing.

Factors contributing to increased risk of wound complications in Systemic Lupus Erythematosus patients

People with Systemic Lupus Erythematosus who have surgery are more likely to have problems with their wounds because of some aspects of their disease. Understanding these variables is essential for managing this vulnerable group during surgery and getting the best results. To begin, the action of the disease itself has a significant effect on the risk of complications from wounds in people with Systemic Lupus Erythematosus. Systemic Lupus Erythematosus is characterized by active inflammation, making it usually harder for wounds to heal. Systemic Lupus Erythematosus causes inflammatory cytokines and immune system disruptions, which make it harder for wounds to heal and make people more likely to get infections. The ongoing inflammation not only slows down tissue repair but also weakens the immune system at the surgical site, making patients more likely to get surgical site infections and other problems linked to their wounds.

Secondly, there is a double-edged sword regarding surgical procedures and immunosuppressive medicine usage in SLE care. The primary medication for Systemic Lupus Erythematosus, corticosteroids, has strong immunosuppressive effects by reducing the activity of immune cells and the production of cytokines. Although necessary for disease treatment, long-term use of corticosteroids can cause tissue fragility and decreased wound healing. Additionally, the immune response is further compromised, and the risk of surgical infections is increased by various immunosuppressants used in Systemic Lupus Erythematosus therapy, including azathioprine, methotrexate, and mycophenolate mofetil. Patients with Systemic Lupus Erythematosus are at a higher risk of developing wound problems following surgery due to the cumulative immunosuppressive impact of these drugs.

Because of its significant effect on wound healing, corticosteroid usage in SLE therapy deserves special consideration. Atrophy, poor collagen synthesis, and reduced tensile strength are side effects of long-term corticosteroid treatment that make tissues more vulnerable to damage and slow wound healing. Wound healing is already complicated for people with Systemic Lupus Erythematosus, and corticosteroids make it even worse by weakening the skin and making it more prone to rips and disintegration. When making decisions during the pre- and postoperative periods, weighing the pros and cons of using corticosteroids to treat Systemic Lupus Erythematosus and their impact on wound healing is essential.

The surgical therapy of vasculopathy, a significant complication of SLE, is another obstacle. Vascular vulnerability, thrombosis, and reduced blood flow can result from inflammation of the blood vessels, which can complicate surgical treatments and slow down the healing of wounds. Intraoperative bleeding and postoperative complications such as thromboembolism are more likely to occur in patients with vasculopathy during surgery. Postoperative ischemia, tissue necrosis, and delayed wound healing are among the risks that Systemic Lupus Erythematosus patients face due to their reduced vascular integrity. To reduce the likelihood of wound-related complications in SLE patients having surgery, it is crucial to closely monitor these patients and take proactive measures to control vascular issues.

Nutritional deficits, common in SLE patients, can also affect wound healing success. A compromised immune system, impaired collagen synthesis, and impaired tissue repair processes are all symptoms of chronic autoimmune illnesses that can lead to malnutrition. As a result, individuals with these conditions may experience slower wound healing and be more vulnerable to infections. Inadequate protein and energy intake and micronutrient deficits like zinc and vitamin D hinder the body's capacity to repair damaged tissues and build an adequate immunological response following surgery. Patients with Systemic Lupus Erythematosus may benefit from dietary therapies and nutritional supplements to optimize their healthy state before surgery, which may reduce the likelihood of wound complications and increase the success rate of the operation.

Impact of wound complications on postoperative recovery and outcomes

There is no way to minimize the significance of wound complications on a patient's surgical recovery and results; these problems can significantly hinder the patient's advancement and general health. Because of the need for additional procedures and long-term monitoring, wound complications typically lengthen hospital stays. Patients' lives and routines are upended, leading to more significant anxiety and stress, and healthcare resources are further stretched thin as a result of the more extended hospital stays. There is an increased risk of death due to the worsening of serious complications related to wounds, such as severe surgical site infections (SSIs). Managing patients' general well-being becomes even more challenging when central infections arise, necessitating intensive treatment. Pain, discomfort, and mental anguish are just a few ways in which wound complications can lower a patient's standard of living. These psychological and physical challenges might greatly diminish a patient's capacity to participate in everyday tasks and have a satisfying life after surgery. Patients may suffer from anxiety, despair, and a sense of powerlessness as a result of wound complications, which can make their healing process much more challenging. Ultimately, wound complications have far-reaching consequences that go beyond mere physical pain, impacting multiple facets of a patient's healing process and general health. To optimize postoperative results and improve patient happiness and quality of life, it is critical to recognize these complications' relevance and apply methods to prevent and treat them efficiently.

Role of Rituximab in Systemic Lupus Erythematosus Management

Rituximab, a monoclonal antibody that targets CD20-positive B cells, has become an interesting new way to treat Systemic Lupus Erythematosus. It was first created to treat B-cell cancers. Still, it also helps with autoimmune diseases like systemic lupus erythematosus because it can eliminate harmful B cells, which fixes the immune system problems common in this condition. Rituximab is usually only given to people whose sickness doesn't get better with other immunosuppressant drugs or who can't handle them. It is mainly used off-label for Systemic Lupus Erythematosus because regulatory agencies have not officially approved it. Still, its role in treating Systemic Lupus Erythematosus keeps changing, and more and more proof supports that it works and is safe.

In numerous clinical investigations and observational research studies, Rituximab has been shown to help reduce disease activity and improve results in people with Systemic Lupus Erythematosus. For example, Merrill et al. (2010) did a groundbreaking study on Rituximab and 257 systemic lupus erythematosus patients. They found that it significantly reduced disease activity and use of steroids compared to a placebo. The EXPLORER and LUNAR trials, which came after, confirmed these results by showing that Rituximab therapy improved disease activity, serologic markers, and total clinical response. Rituximab has also been shown to work in some groups of Systemic Lupus Erythematosus clients, like those with lupus nephritis or intractable disease. This shows how versatile it is and how it could be used in individual treatment plans. It still needs to be fully clear how Rituximab works to treat systemic lupus erythematosus. Still, it's thought that its ability to get rid of harmful B cells, change the production of cytokines, and control immune responses all play a part in how well it works in the clinic.

Besides its role in managing Systemic Lupus Erythematosus, Rituximab may also help Systemic Lupus Erythematosus patients have fewer wound problems after surgery. One possible way is to stop the production of autoantibodies, which damages tissues and makes it harder for wounds to heal in people with systemic lupus erythematosus. Rituximab blocks the creation of autoantibodies that attack self-antigens by going after CD20-positive B cells. This slows down the inflammatory process and helps the body heal itself. Rituximab may also change the inflammatory environment at the surgery site by affecting different types of immune cells, such as regulating B and T cells (Martínez-Martínez et al., 2012). This may help the wound heal better. There is a limited amount of clinical evidence about how Rituximab affects wound complications after surgery in people with Systemic Lupus Erythematosus. Still, the drug's ability to change the immune system and lower the activity of the disease suggests that it might help improve surgical outcomes in this group. More studies need to be done to determine precisely how Rituximab helps wounds heal and what role it might play in reducing complications after surgery in people with Systemic Lupus Erythematosus.

Research Evidence on Rituximab and Postoperative Wound Complications

A change in the therapy landscape for rheumatologic diseases is seen in using Rituximab in systemic lupus erythematosus. Treating inflammatory diseases like systemic lupus erythematosus has become much easier with the advent of targeted pharmaceuticals, especially biological treatments like Rituximab (Martínez-Martínez et al., 2012) As a result of its effectiveness in treating a wide range of systemic symptoms associated with systemic lupus erythematosus, including arthritis, serositis, Nephritis, hemolytic nephropathy, and thrombocytopenia, Rituximab has recently gained attention as a potential therapy option. It is worth mentioning that Rituximab has shown promise in improving clinical parameters and allowing for the decrease or elimination of immunosuppressant medicines like corticosteroids.

Research has shown that Rituximab can help people with kidney failure, blood problems, arthritis, and lung involvement, suggesting that it could be a helpful treatment option for various conditions. Lupus nephritis has shown histological improvements, especially in instances that have not responded to traditional treatments like cyclophosphamide. In addition, Rituximab can significantly enhance hematologic involvement by reducing B-lymphocytes, which is especially helpful in cases of autoimmune cytopenia caused by systemic lupus erythematosus (Merrill et al., 2010). Nevertheless, randomized trials have shown conflicting results when interpreting Rituximab's effectiveness in treating systemic lupus erythematosus. Despite promising results in clinical practice, Rituximab has not been consistently shown to be more effective than placebo in these investigations. Afro-American and Hispanic communities, for example, may reap advantages, according to subgroup studies. Protocol design and research heterogeneity continue to be contentious topics, with some criticizing these factors for their potential to hinder reliable assessments of Rituximab's effectiveness. Studying systemic lupus erythematosus with the larger samples needed to achieve statistical significance is difficult due to challenges connected to the diversity of symptoms and patient demographics. Systemic lupus erythematosus and other immunosuppressants are potential confounding factors that make evaluating the safety and side effects of rituximab treatment in this population difficult.

Limitations and gaps in current research

The variability of Systemic Lupus Erythematosus symptoms makes studying Rituximab difficult. Systemic Lupus Erythematosus is an autoimmune disease that causes arthritis, Nephritis, hematological abnormalities, and pulmonary dysfunction. Patients may have different illness severity, organ participation, and therapy responses, complicating clinical trial design. Thus, interpreting and extrapolating study results to the broader Systemic Lupus Erythematosus community is challenging, emphasizing the need to stratify individuals by illness features in future research.

Protocol design issues also limit systemic lupus erythematosus Rituximab research. Randomized controlled trials with limited sample sizes, short monitoring periods, and unstandardized treatment methods have methodological flaws. These limitations can lower study validity and reliability, making assessing Rituximab's safety and effectiveness hard. These protocol design issues must be addressed in more extensive, well-designed clinical studies with rigorous methodology to prove Rituximab's efficacy in treating SLE.

ituximab's efficacy and safety in SLE are unknown over time. Short-term studies have shown promising results, although treatment duration and late-onset side effects are unknown. Long-term benefits and hazards of Rituximab therapy in Systemic Lupus Erythematosus patients must be assessed in longitudinal trials. These investigations can also reveal disease relapse, therapy termination, and Rituximab's long-term effects.
Rituximab clinical trials may exclude patients with severe renal or central nervous system symptoms of systemic lupus erythematosus. This underrepresentation reduces study generalizability and may underestimate Rituximab's benefits and hazards in these patient categories. Future Rituximab trials must include different patient cohorts to thoroughly assess its benefits and dangers across all systemic lupus erythematosus patient subgroups.
Several factors make it challenging to accurately identify Rituximab side effects in Systemic Lupus Erythematosus patients. Rituximab-related adverse effects are difficult to attribute due to the overlap of symptoms with Systemic Lupus Erythematosus and other immunosuppressants (Martínez-Martínez et al., 2012). Due to the lack of consistent adverse event reporting standards, study results are incomparably different. Future research should prioritize standardized negative effect assessment to comprehend Rituximab's safety in Systemic Lupus Erythematosus patients.

CONCLUSION

Rituximab may reduce postoperative wound complications in SLE patients undergoing surgery. Studies have shown that Rituximab may alleviate systemic signs of SLE, including arthritis, Nephritis, hematological abnormalities, and pulmonary dysfunction. Rituximab may also enhance clinical metrics and lessen the requirement for immunosuppressants like corticosteroids, which can exacerbate postoperative problems. Ritumab's propensity to diminish B-lymphocytes may also reduce autoimmune responses that can worsen wound healing in systemic lupus erythematosus patients. With substantial therapeutic and scientific implications, Ritumab may reduce postoperative wound complications in Systemic Lupus Erythematosus patients. Ritumab may be used as an additional therapy for systemic lupus erythematosus patients having surgery, especially those with active disease or significant comorbidities. However, more research is needed to determine the appropriate dosage, timing, and length of rituximab treatment and its long-term impact on wound healing and surgical outcomes. Future studies should address protocol design issues, varied patient populations, and standardized adverse event assessment. Researchers can improve Systemic Lupus Erythematosus patients' surgical care by addressing these issues and improving our understanding of Rituximab's efficacy and safety

Aspect of Treatment	Findings
Introduction of Biological Therapy	Rheumatologic patient medication use has increased due to cytokines and cellular receptor-targeted medicines.
Treatment with RTX in SLE	RTX has showed promise in treating SLE systemic symptoms like arthritis, serositis, Nephritis, hemolytic uremic syndrome, and thrombocytopenia. This has allowed corticosteroids and other immunosuppressants to be reduced or stopped.
Effectiveness of RTX	RTX has been shown to treat SLE, with B-cell depletion and regeneration linked with clinical response. This medication improves histological activity in cyclophosphamide-resistant lupus nephritis and treats hematologic symptoms.
Impact on Specific Manifestations	SLE patients with severe arthritis, interstitial pneumonitis, and other pulmonary symptoms benefit from RTX. Serositis cases have also improved.
Safety and Controversy	RTX has showed promise in clinical practice, but randomized studies have not regularly established its clinical advantage over placebo. Some studies demonstrate ethnic subgroup-based efficacy, but RTX and placebo safety profiles are identical.
Considerations and Future Studies	SLE appearance, severity, and ethnicity vary, making study design and interpretation difficult. Future trials should include individuals with severe symptoms and examine RTX's efficacy in varied patient populations to further appreciate its SLE therapeutic potential.

Table 1: Summary of the research of the use of Rituximab in Reducing Postoperative Wound Complications in Systemic Lupus Erythematosus Patients

REFERENCES

1. Chan, O. T., Hannum, L. G., Haberman, A. M., Madaio, M. P., & Shlomchik, M. J. (1999). A novel mouse with B cells but lacking serum antibody reveals an antibody-independent role for B cells in murine lupus. The Journal of experimental medicine, 189(10), 1639-1648. https://rupress.org/jem/article-abstract/189/10/1639/7841

2. Chan, O., Madaio, M. P., & Shlomchik, M. J. (1999). B cells are required for lupus nephritis in the polygenic, Fas-intact MRL model of systemic autoimmunity. The Journal of Immunology, 163(7), 3592-3596. https://journals.aai.org/jimmunol/article/163/7/3592/105276

3. Cranney, A., & Adachi, J. D. (2002). Corticosteroid-induced osteoporosis: a guide to optimum management. Treatments in Endocrinology, 1, 271-279. https://link.springer.com/article/10.2165/00024677-200201050-00001

4. Edwards, J. C., Szczepański, L., Szechiński, J., Filipowicz-Sosnowska, A., Emery, P., Close, D. R., ... & Shaw, T. (2004). Efficacy of B-cell–targeted therapy with rituximab in patients with rheumatoid arthritis. New England Journal of Medicine, 350(25), 2572-2581. https://www.nejm.org/doi/full/10.1056/NEJMoa032534

5. Ferreira, M., Salgueiro, A. B., Estrada, J., Ramos, J., Ventura, L., Vale, M. C., & Barata, D. (2008). Lúpus Eritematoso Sistémico. Acta Médica Portuguesa, 21(2), 199-204. http://www.actamedicaportuguesa.com/revista/index.php/amp/article/view/768

6. Fiorina, P., & Sayegh, M. H. (2009). B cell-targeted therapies in autoimmunity: rationale and progress. F1000 biology reports, 1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2924700/

7. Hochberg, M. C. (1997). Updating the American College of Rheumatology revised criteria for the classification of systemic lupus erythematosus. Arthritis and rheumatism, 40(9), 1725-1725. https://europepmc.org/article/med/9324032

8. Knight, C., Hind, D., Brewer, N., & Abbott, V. (2004). Rituximab (MabThera) for aggressive non-Hodgkin's lymphoma: systematic review and economic evaluation. Health Technology Assessment (Winchester, England), 8(37), iii-ix. https://europepmc.org/books/nbk62306

9. Landeiro, L., Almeida, M., Cal, F. F., Cerqueira, T. S., Frempong, R. F., Espírito Santo, T. M., ... & Pallotta, R. (2005). B-Cell depletion in the treatment of autoimmune cytopenias. Revista Brasileira de Hematologia e Hemoterapia, 27, 102-105. https://www.scielo.br/j/rbhh/a/gGFqnDMRndPGfqVSYc346ch/abstract/?format=html&lang=en

10. Leandro, M. J., Edwards, J. C., Cambridge, G., Ehrenstein, M. R., & Isenberg, D. A. (2002). An open study of B lymphocyte depletion in systemic lupus erythematosus. Arthritis & Rheumatism, 46(10), 2673-2677. https://acrjournals.onlinelibrary.wiley.com/doi/abs/10.1002/art.10541

11. Leandro, M. J., Edwards, J. C., Cambridge, G., Ehrenstein, M. R., & Isenberg, D. A. (2002). An open study of B lymphocyte depletion in systemic lupus erythematosus. Arthritis & Rheumatism, 46(10), 2673-2677. https://acrjournals.onlinelibrary.wiley.com/doi/abs/10.1002/art.10541

12. Lima, S. M., & Giorgi, R. D. (2008). Agentes biológicos–principais indicações em Reumatologia. Temas de reumatologia clínica, 9(3), 81-6.

13. Lipsky, P. E. (2001). Systemic lupus erythematosus: an autoimmune disease of B cell hyperactivity. Nature immunology, 2(9), 764-766. https://www.nature.com/articles/ni0901-764

14. Looney, R. J., Anolik, J. H., Campbell, D., Felgar, R. E., Young, F., Arend, L. J., ... & Sanz, I. (2004). B cell depletion as a novel treatment for systemic lupus erythematosus: a phase I/II dose-escalation trial of rituximab. Arthritis & Rheumatism: Official Journal of the American College of Rheumatology, 50(8), 2580-2589. https://onlinelibrary.wiley.com/doi/abs/10.1002/art.20430

15. Maloney, D. G., Grillo-López, A. J., White, C. A., Bodkin, D., Schilder, R. J., Neidhart, J. A., ... & Levy, R. (1997). IDEC-C2B8 (Rituximab) anti-CD20 monoclonal antibody therapy in patients with relapsed low-grade non-Hodgkin's lymphoma. Blood, The Journal of the American Society of Hematology, 90(6), 2188-2195. https://ashpublications.org/blood/article-abstract/90/6/2188/174699

16. Plosker, G. L., & Figgitt, D. P. (2003). Rituximab: a review of its use in non-Hodgkin's lymphoma and chronic lymphocytic leukaemia. Drugs, 63(8), 803-843. https://link.springer.com/article/10.2165/00003495-200363080-00005

17. Ramos-Casals, M., Soto, M. J., Cuadrado, M. J., & Khamashta, M. A. (2009). Rituximab in systemic lupus erythematosusA systematic review of off-label use in 188 cases. Lupus, 18(9), 767-776. https://journals.sagepub.com/doi/abs/10.1177/0961203309106174
18. Scheinberg, M., Hamerschlak, N., Kutner, J. M., Ribeiro, A. A. F., Ferreira, E., Goldenberg, J., ... & Chahade, W. H. (2006). Rituximab in refractory autoimmune diseases: Brazilian experience with 29 patients (2002-2004). Clinical and experimental rheumatology, 24(1), 65. https://www.clinexprheumatol.org/article.asp?a=2790
19. Vital, E. M., Dass, S., Buch, M. H., Henshaw, K., Pease, C. T., Martin, M. F., ... & Emery, P. (2011). Rituximab responses in systemic lupus erythematosus explained by B cell biomarkers. Arthritis Rheum, 63(10), 3038-47.
20. Vollenhoven, R. V., Gunnarsson, I., Welin-Henriksson, E., Sundelin, B., Österborg, A., Jacobson, S. H., & Klareskog, L. (2004). Biopsy-verified response of severe lupus nephritis to treatment with rituximab (anti-CD20 monoclonal antibody) plus cyclophosphamide after biopsy-documented failure to respond to cyclophosphamide alone. Scandinavian journal of rheumatology, 33(6), 423-427. https://www.tandfonline.com/doi/abs/10.1080/03009740410010227
21. Keane, M. P., & Lynch, J. P. (2000). Pleuropulmonary manifestations of systemic lupus erythematosus. Thorax, 55(2), 159-166. https://thorax.bmj.com/content/55/2/159.short
22. Lim, S. W., Gillis, D., Smith, W., Hissaria, P., Greville, H., & Peh, C. A. (2006). Rituximab use in systemic lupus erythematosus pneumonitis and a review of current reports. Internal medicine journal, 36(4), 260-262. https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1445-5994.2006.01055.x
23. Martínez-Martínez, M. U., & Abud-Mendoza, C. (2012). Recurrent diffuse alveolar haemorrhage in a patient with systemic lupus erythematosus: long-term benefit of rituximab. Lupus, 21(10), 1124-1127. https://journals.sagepub.com/doi/abs/10.1177/0961203312444171
24. Fernandez-Nebro, A., De la Fuente, J. M., Carreno, L., Izquierdo, M. G., Tomero, E., Rúa-Figueroa, I., ... & García-Vicuña, R. (2012). Multicenter longitudinal study of B-lymphocyte depletion in refractory systemic lupus erythematosus: the LESIMAB study. Lupus, 21(10), 1063-1076. https://journals.sagepub.com/doi/abs/10.1177/0961203312446627
25. Kardynał, A., & Rudnicka, L. (2010). Rituximab in systemic lupus erythematosus. Part II: review of clinical experience. Polski Merkuriusz Lekarski: Organ Polskiego Towarzystwa Lekarskiego, 29(170), 135-140. https://europepmc.org/article/med/20842830
26. Merrill, J. T., Neuwelt, C. M., Wallace, D. J., Shanahan, J. C., Latinis, K. M., Oates, J. C., ... & Brunetta, P. G. (2010). Efficacy and safety of rituximab in moderately-to-severely active systemic lupus erythematosus: the randomized, double-blind, phase II/III systemic lupus

erythematosus evaluation of rituximab trial. Arthritis & Rheumatism: Official Journal of the American College of Rheumatology, 62(1), 222-233. https://acrjournals.onlinelibrary.wiley.com/doi/abs/10.1002/art.27233
27. Rovin, B. H., Furie, R., Latinis, K., Looney, R. J., Fervenza, F. C., Sanchez-Guerrero, J., ... & LUNAR Investigator Group. (2012). Efficacy and safety of rituximab in patients with active proliferative lupus nephritis: the Lupus Nephritis Assessment with Rituximab study. Arthritis & Rheumatism, 64(4), 1215-1226. https://acrjournals.onlinelibrary.wiley.com/doi/abs/10.1002/art.34359
28. Díaz-Lagares, C., Croca, S., Sangle, S., Vital, E. M., Catapano, F., Martínez-Berriotxoa, A., ... & The, U. K. (2012). Efficacy of rituximab in 164 patients with biopsy-proven lupus nephritis: pooled data from European cohorts. Autoi munity reviews, 11(5), 357-364. https://www.sciencedirect.com/science/article/pii/S1568997211002163
29. Scheinberg, M. A. (2011). Lupus clinical trials: medication failure or failure in study design. Revista Brasileira de Reumatologia, 51, 410-411. https://www.scielo.br/j/rbr/a/xnqV6zBhMTRjCLNrq85L5xn/?lang=en
30. Alsanafi, S., Kovarik, C., Mermelstein, A. L., & Werth, V. P. (2011). Rituximab in the treatment of bullous systemic lupus erythematosus. JCR: Journal of Clinical Rheumatology, 17(3), 142-144. https://journals.lww.com/jclinrheum/fulltext/2011/04000/Rituximab_in_the_Treatment_of_Bullous_Systemic.7.aspx