

**Bloodless Treatment in Jehovah's Witnesses with Acute Myeloid Leukemia**

Rattapan Lamoon, B. Pharm., M.D.¹, Apichai Leelasiri, M.D.², Tawatchai Pongpruttipan, M.D.³

¹Department of Medicine, Phramongkutklao Army Hospital and College of Medicine, Bangkok 10400, Thailand

²Department of Medicine, School of Medicine, Mae Fah Luang University, Chiang Rai 57100, Thailand

³Department of Pathology, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok 10700, Thailand

Received 7 March 2023 • Revised 31 March 2023 • Accepted 25 April 2023 • Published online 1 May 2023

This paper was presented in-part at Annual Scientific Meeting 2022, School of Medicine, Mae Fah Luang University, Chiang Rai, Thailand on 29 November 2022.

Abstract: Jehovah's Witnesses are a millenarian Christian faith with approximately 8.5 million adherents worldwide involved in evangelism and a much larger number (nearly 20 million) who associate with them.¹ In Thailand, there are more than 5,000 Jehovah's Witnesses. They value life and accept the vast majority of medical treatments. However, they do not accept allogeneic blood transfusion therapy because of their understanding of Biblical statements to abstain from blood. We report the case of a Thai woman who presented with pruritus for 6 weeks and was diagnosed acute myeloid leukemia (AML). She received treatment without any blood component transfusion and achieved complete remission. We also used measures and drugs that alleviated anemia and bleeding problems in order to avoid blood transfusion. Because the number of Jehovah's Witnesses is increasing, growing numbers of non-Witness patients prefer treatment without blood transfusion, and because blood inventory shortages, safety, and blood costs continue to be of concern in many countries, this is a relevant topic for clinicians. Management of patients without allogeneic blood is a medical and ethical challenge for medical practitioners in Thailand, but it can be met as we show in this case report.

Keywords: Jehovah's Witnesses, Acute myeloid leukemia, Optimal Patient Blood Management

Introduction

Jehovah's Witnesses are a Christian faith that had its modern beginnings in the 1870s in the US. In their latest report from 2022, there were approximately 8.5 million Jehovah's Witnesses worldwide¹, including more than 5,000 in Thailand. Jehovah's Witnesses believe that life is sacred and

accept the vast majority of medical treatments. However, they do not accept transfusions of allogeneic (donor) whole blood, red blood cells, white blood cells, platelets, and plasma.² Neither do they accept preoperative autologous blood donation for later reinfusion. Although the risks associated

Corresponding author: Rattapan Lamoon, B. Pharm., M.D.

Department of Medicine, Phramongkutklao Army Hospital and College of Medicine, Bangkok 10400, Thailand

E-mail: thermometer@windowslive.com

©2023 GMSMJ. Hosting by Mae Fah Luang University. All rights reserved

with allogeneic blood are well established, the Witnesses' primary reason for declining blood transfusion is religious. Both the Old and New Testaments clearly command them to abstain from blood. (Genesis 9:4; Leviticus 17:10; Deuteronomy 12:23; Acts 15:28, 29). Also, God views blood as representing life. (Leviticus 17:14). So, they avoid taking blood not only in obedience to God but also out of respect for him as the Giver of life.³ At one time, the medical community generally viewed strategies for avoiding transfusions, so-called bloodless medicine, as extreme, even suicidal, but this has changed in recent years. For example, in 2004, an article published in a medical education journal stated that "many of the techniques developed for use in Jehovah's Witness patients will become standard practice in years to come."³ More recently, in 2021 the World Health Organization urged all nations to make wider use of so-called Patient Blood Management (PBM) strategies to conserve and manage patients' own blood in order to preempt the use of allogeneic blood transfusion to improve patient outcomes, reduce costs, and respect patient autonomy. In the past, blood component transfusion has been viewed as a routine or standard treatment. However, the management of patients who are Jehovah's Witnesses can be a medical and ethical challenge for some physicians and health-related personnel. Here, we report successful treatment of newly diagnosed acute myeloid leukemia presenting with pruritus. This can be an example of bloodless management for Jehovah's Witnesses in medical practice of Thailand.

Case Presentation

A 73-year-old housewife Jehovah's Witnesses with underlying diseases of hypertension, DM type 2 and ischemic heart disease, living in Bangkok presented with six weeks of pruritus. Before her symptom, she stated having COVID-19 vaccination and had pruritus with some response to topical corticosteroid. She then developed skin lesion on both forearms and anorexia. She went to see medical attention and was found to have anemia, leukopenia and thrombocytopenia. Because of being Jehovah's Witnesses, she was referred to another hospital for bone marrow examination to get definite diagnosis. Her current medication was novomix, isosorbide dinitrate, bisoprolol, aspirin, azilsartan, atorvastatin, hydrochlorothiazide, amlodipine, tibolone, omeprazole, vitamin C, nicergoline, piracetam, betahistine, vitamin B12, clobazam, clonazepam and dimenhydrinate. She had 2 healthy children; both were also Jehovah's Witnesses. At hematology clinic, physical examination revealed an obese old woman, looked fatigue and moderate anemia without jaundice or palpable lymph nodes. She had no palpable liver and spleen. Multiple well defined erythematous scaly papules and thin plaques were seen on both forearms (Figure 1). She also had pitting edema 2+ on both legs. CBC showed Hct 27%, WBC $2.93 \times 10^9/L$, PMN 27%, L 35%, M 36%, B 2%, platelet $49 \times 10^9/L$, NRBC 4%, MCV 91 fL. Bone marrow examination (Figure 2) revealed blast cells 50% and dyserythropoiesis of erythroid cells. Immunohistochemistry (IHC) of blast cells showed CD34+, CD117+, CD33+, MPO+, CD68-, lysozyme+, CD3-, PAX5- findings were consistent with acute myeloid leukemia (Figure 3). Bone marrow cytogenetics revealed 46, XX.

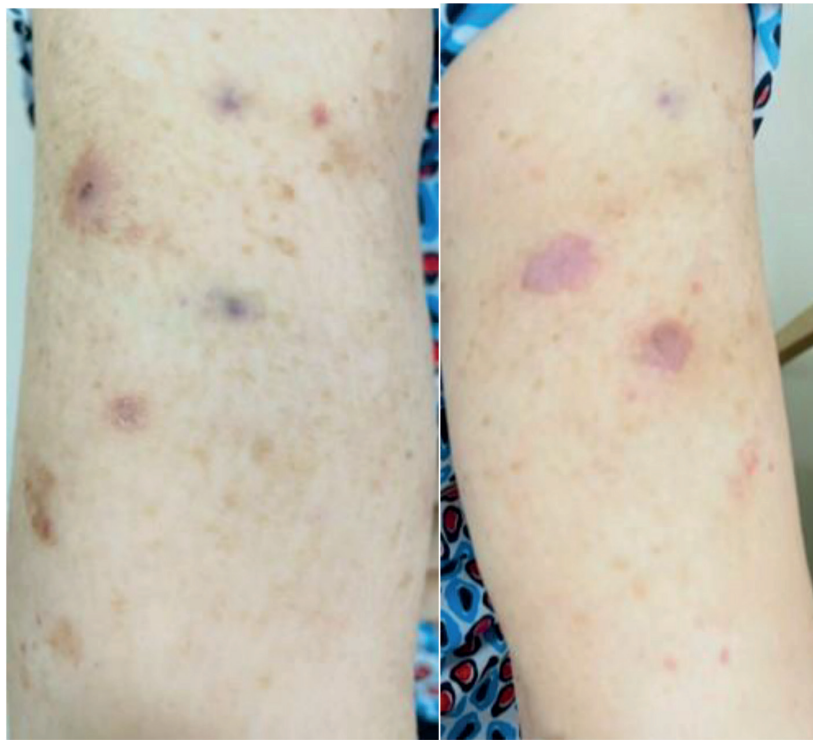


Figure 1 Skin lesions on both forearms

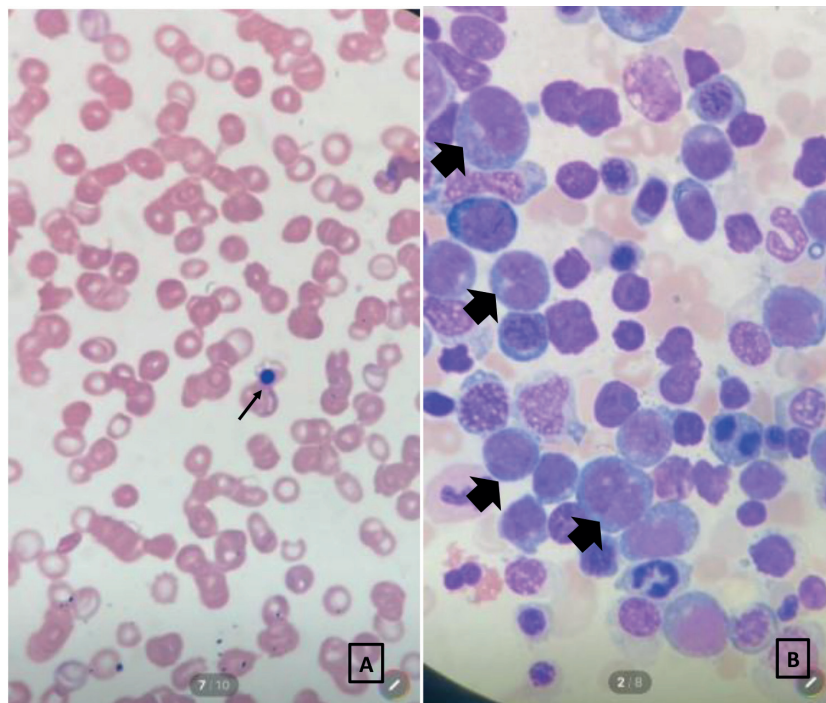


Figure 2 Peripheral blood smear (A) shows pancytopenia with nucleated red cell (arrow). Bone marrow smear (B) shows dyserythropoiesis with blast cells (arrowhead).

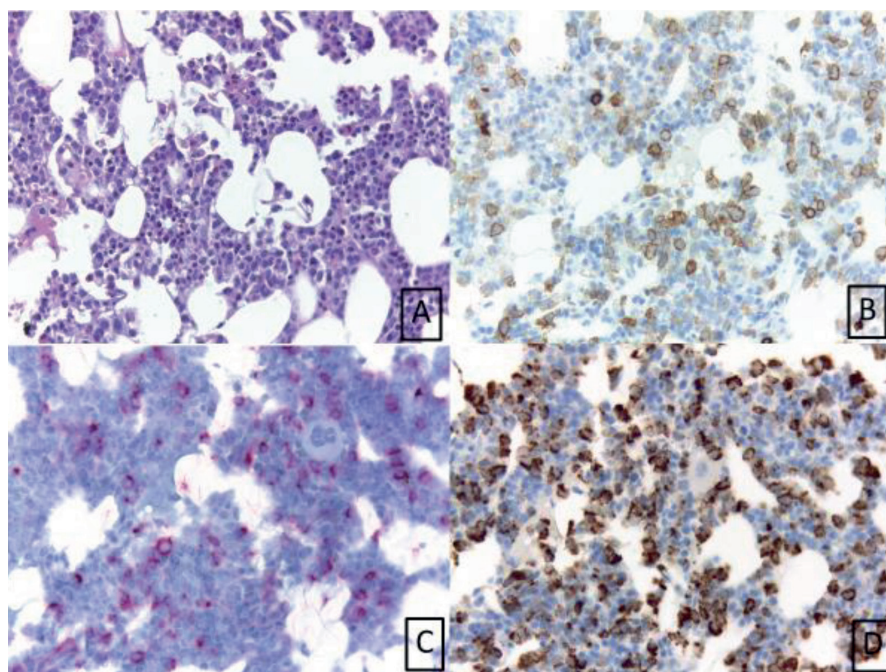


Figure 3 Bone marrow biopsy (H&E) (A) shows hypercellular marrow with mildly increased mononuclear cell infiltrate. Immunohistochemistry for CD34 (B), CD117 (C) and MPO (D) highlights increased myeloblasts.

Patient received azacytidine 12 cycles for treatment of acute myeloid leukemia with complete response but unfortunately had relapsed disease and so, venetoclax was added with causing lowering platelet from $15 \times 10^9/L$ to $7 \times 10^9/L$. Patient subsequently received romiplostim injection and platelet was up to $26 \times 10^9/L$. She had never received any blood component during treatment which was accepted by her belief. She did not have any serious bleeding from treatment. She also received erythropoietin injection for anemia.

Discussion

This patient presented with pruritus and fatigue for 6 weeks. She had history of COVID-19 vaccination before this illness which we did not know this illness was vaccine related or co-incidence. She had pancytopenia and bone marrow examination was diagnostic. Because, the patient was Jehovah's Witnesses, this could be more complicated during treatment. Most patients who received induction chemotherapy for

acute myeloid leukemia usually experienced infection, bleeding and anemia which most of them required blood component therapy. The patient refused any blood component transfusion. So, if patient needed transfusion, what should be the suitable management? We had to critically planned for the best treatment and prepared for complication management before treatment initiation. Because of the aggressiveness of disease, we had not much time. Treatment should be started as soon as possible.

Management of patients with Jehovah's Witnesses should begin with awareness and open-minded attitude to patients' beliefs. We have to accept the truth that there are many patients with this denomination and they don't accept blood component treatment in all circumstances. We have to respect their rights and decision. This is such a medical challenge of physician capability and teamwork to flexible using alternative therapy in case that patients need it. With advanced knowledge and technology in medicine, we can use MIS (minimally invasive surgery)

e.g., laparoscopic, limited surgery, if patients need surgery or may use radiation therapy instead of surgery if possible. Intervention radiology such as embolization or surgical clipping can help to stop bleeding during surgical procedure. For perioperative blood management, optimization of hemoglobin levels preoperatively, attention to blood-salvaging methods intraoperatively, and minimization of blood draws postoperatively should be applied.⁴ Hemostatic agents such as fibrin glue, recombinant activated factor VII, prothrombin complex concentrate (PCC) can be used by patients' permission. Tranexamic acid and DDAVP can also be applied for minor bleeding. We also have drugs activating production of blood cells⁵⁻⁶ such as erythropoietin (Epoetin) for red cells, G-CSF (granulocyte-colony stimulating factor) for white blood cells and thrombopoietin receptor agonists such as eltrombopag and romiplostim for platelet production. These measurements can alleviate the need for blood component requirement. Hematology consultation can be helpful in management of patients undergoing surgery.⁷ For specific treatment of cancer, we should avoid any aggressive chemotherapy, if possible, by using alternative such as azacytidine, decitabine venetoclax for acute myeloid leukemia. All-trans retinoic acid (ATRA) and arsenic trioxide should be considered for acute promyelocytic leukemia treatment. At present, we have many targeted therapy and immunotherapy for cancer treatment such as gefitinib and erlotinib in lung cancer with EGFR mutation. So, the role of aggressive chemotherapy should be less, and this brings less complication which resulted in less requirement for blood component.

Conclusion

We reported case of acute myeloid leukemia in Jehovah's Witnesses Thai patient. Although this was serious hematologic malignancy and had potentially required

blood component during treatment, we successfully used bloodless management in this case which was accepted by the patient and relatives. This was such a challenge in medical and ethical issue and could be an example for physician and teamwork to coping with their illness in the future.

Conflict of interest

The authors declare no conflict of interest in this case report.

References

1. How Many of Jehovah's Witnesses Are There Worldwide? Available at: <https://www.jw.org/en/jehovahs-witnesses/faq/how-many-jw/>
2. Ridley DT. Jehovah's Witnesses' refusal of blood: obedience to scripture and religious conscience. *J Med Ethics*. 1999; 25: 469-72.
3. What Do Jehovah's Witnesses Believe? - JW.org <https://www.jw.org>
4. Rashid M, Kromah F, Cooper C. Blood transfusion and alternatives in Jehovah's Witness patients. *Curr Opin Anaesthesiol*. 2021; 34 (2): 125-130. doi: 10.1097/ACO.0000000000000961.
5. Holt RL, Martin TD, Hess PJ, Beaver TM, Klodell CT. Jehovah's Witnesses requiring complex urgent cardiothoracic surgery. *Ann Thorac Surg*. 2004; 78 (2): 695-7. doi: 10.1016/S0003-4975(03)01494-2.
6. Nash MJ, Cohen H. Management of Jehovah's Witness patients with haematological problems. *Blood Rev*. 2004; 18 (3): 211-7. doi: 10.1016/S0268-960X(03)00065-1.
7. Leelasiri A, Srichaikul T. Jehovah's Witnesses. Role of hematologist. Report of a case. *RTA Med J*. 1997; 50: 206-8.