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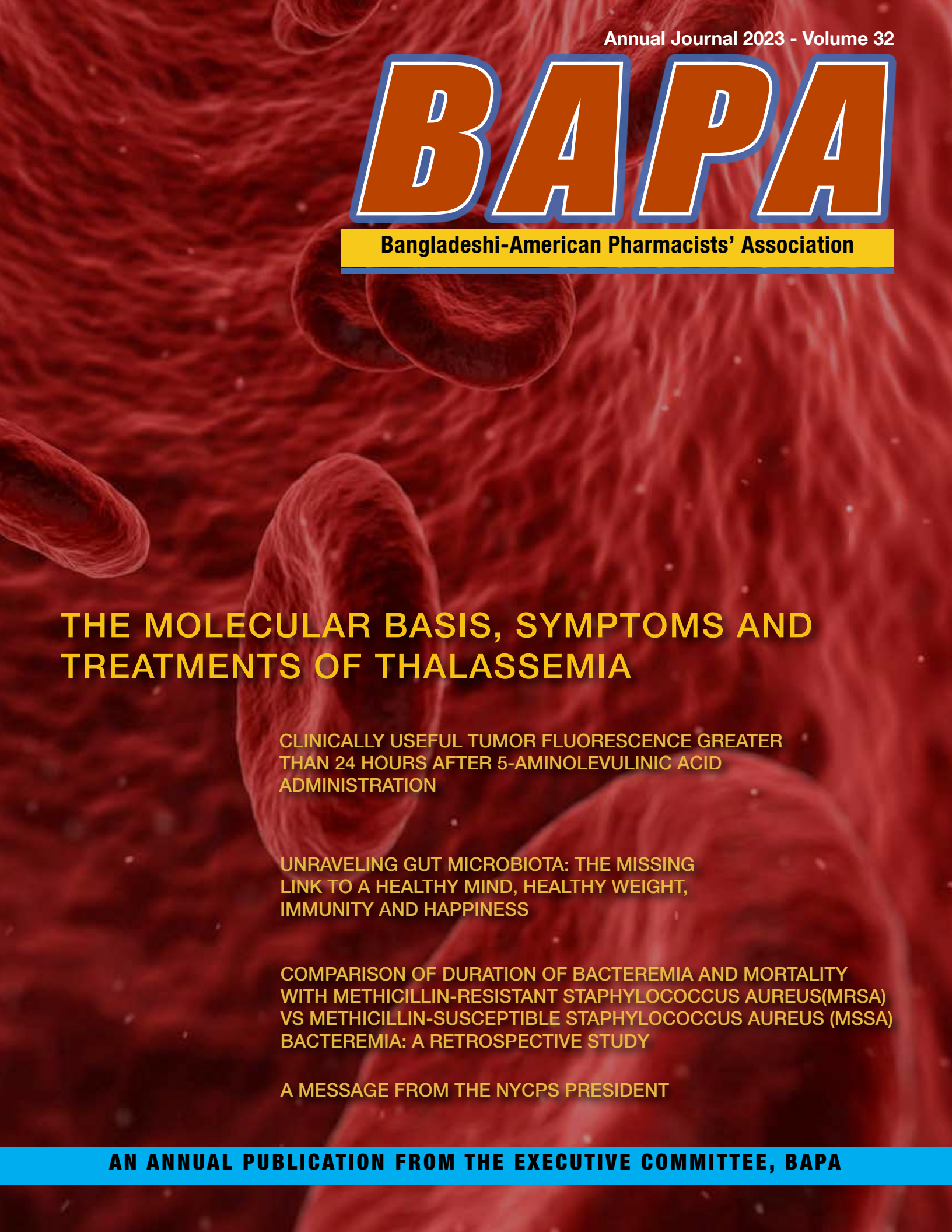
BAPA

Bangladeshi-American Pharmacists' Association



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Departed Souls

We deeply regret and mourn the departure of our fellow friends.
We miss them a lot and remember them in our prayers.
In this day of the Convention we will miss their presence.

Nazir Ahmed
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Disclaimer: If we missed anybody's name it is an unintentional mistake.

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BANGLADESHI – AMERICAN PHARMACISTS' ASSOCIATION

32nd Annual Convention Programs

AUGUST 18TH - 20TH, 2023

HILTON PHILADELPHIA AT PENN'S LANDING

201 South Columbus Blvd., Philadelphia, PA 19106

BAPA CONVENTION SCHEDULE AT-A-GLANCE (Offering 9 continuing education credits this year)

Day 1	Friday, August 18, 2023
4:00 PM - 12:00 AM	Check In & Registration Main Lobby and Grand Ballroom Foyer
5:00 PM - 12:00 AM	Vendor Exhibition/ Trade Show Grand Ballroom D
4:00 PM - 8:00 PM	Free Time Dinner will NOT be provided at convention
7:00 PM - 11:00 PM	Musical Performances and Coffee/Snack Break at 10PM Grand Ballroom ABC

Day 2	Saturday, August 19, 2023
8:00 AM - 6:00 PM	Check In & Registration Main Lobby and Grand Ballroom Foyer
9:00 AM - 11:00 AM	Breakfast Buffet Grand Ballroom ABC
8:00 AM - 12:00 AM	Vendor Exhibition/ Trade Show Grand Ballroom D
8:00 AM - 11:00 PM	Prayer Room USS New Jersey
10:00 AM - 1:00 PM	**Continuing Education Meeting** Columbus Ballroom
11:30 AM - 12:30 PM	Coffee Break Columbus Foyer

12:30 PM - 2:00 PM	Lunch Grand Ballroom ABC
1:00 PM - 5:00 PM	**Continuing Education Meeting** Columbus Ballroom
4:00 PM - 4:30 PM	Coffee Break Columbus Foyer
5:30 PM - 7:30 PM	Free Time
7:30 PM - 10:00 PM	Formal Dinner Grand Ballroom ABC
10:00 PM - 2:00 AM	Musical Performance and Closing Show Grand Ballroom ABC
11:00 PM - 12:00 AM	Snacks and Coffee Grand Ballroom Foyer

Day 3	**Sunday, August 20, 2023**
8:00 AM - 2:00 PM	Vendor Exhibition/ Trade Show Grand Ballroom D
8:00 AM - 2:00 PM	Prayer Room & Luggage Room USS New Jersey
9:00 AM - 11:00 AM	**Continuing Education Meeting** Columbus Ballroom
11:00 AM - 1:00 PM	Brunch & Closing Remarks Grand Ballroom ABC
1:00 PM	Departure

Message from the PRESIDENT

Dr. Sabrina A. Rahman

Dear BAPA Members,

Welcome to the 2023 Annual BAPA Convention in Philadelphia, Penn's Landing. I would like to share my immense gratitude and a heart full of appreciation to each and every one of you upon my last BAPA Convention as president.The support of all members has made these terms a resounding success and a true honor. As pharmacists, we play a pivotal role in healthcare, ensuring the well-being of countless individuals through our expertise, dedication, and unwavering commitment. This convention serves as a platform to exchange ideas, share experiences, and enhance our knowledge, ultimately empowering us to provide even better care to our patients. Additionally, a big thank you to our sponsors who have helped contribute to this organization and are an essential part of our foundation.

I am deeply honored to have served as the President of this esteemed organization, Bangladeshi American Pharmacists Association, and I am humbled by the trust you have placed in me. This role has allowed me to witness firsthand the incredible passion and dedication that our community brings to work every day. It is your collective efforts that drive our profession forward and make a lasting impact on the health and lives of those we serve.

Additionally, I would like to express my heartfelt gratitude to our distinguished speakers and sponsors who shared their insights and expertise, enriching our understanding of the latest advancements and best practices in pharmacy. Your contributions have been invaluable in shaping the discussions and fostering an environment of continuous learning.

Of course, none of this would have been possible without the tireless efforts of our organizing team including the executive board and committee. Your hard work, dedication, and attention to detail have ensured the smooth execution of every aspect of this convention and I extend my thanks to you all.

As we conclude this convention, let us carry forward the knowledge gained, continue to collaborate, innovate, and inspire one another to elevate the practice of pharmacy to new heights. Together, we can create a healthier and brighter future for our patients and our profession.

It is an honor to be part of such a dedicated and dynamic community. I look forward to the opportunities that lie ahead. Thank you, and may our shared journey in pharmacy be one of continued growth, compassion, and excellence.

Kind regards,

Dr. Sabrina A. Rahman

President, BAPA

Message from the VICE PRESIDENT

Dr. Lamisa Ahsan

Dear BAPA members,

Welcome to our 32nd annual BAPA Convention at Hilton Philadelphia at Penn's Landing. We hope this weekend gives you an opportunity to engage with pharmacists in other backgrounds, earn Continuing Education credits, enjoy our cultural show and socialize. In addition, a special thank you to our sponsors Micromerchant, Cardinal and our advertisers for making this convention happen year after year.

It was my honor to serve you as your Vice President this past term. A few months ago, we held a BAPA picnic at Belmont Lake state park. It was a great success and we enjoyed seeing everyone who attended. BAPA would not be what it is today without its members. Thank you to all of you who attend our events and the donations you have made throughout the years. You have assisted in numerous ways weather it is to help fellow pharmacists who are sick in Bangladesh, sponsor students, aid families struck with Covid and much more.

My heartfelt gratitude also goes to our president Dr. Sabrina Rahman. She has organized all the events and sent communications throughout the year. In addition, our Executive Board has worked tirelessly for making all the events possible.

Please don't hesitate to contact me or the executive board if you have any questions, comments, or advice. We look forward to seeing you and your family in future BAPA events and conventions. We also encourage younger pharmacists and pharmacy students to join BAPA and strengthen our organization.

Thank you,

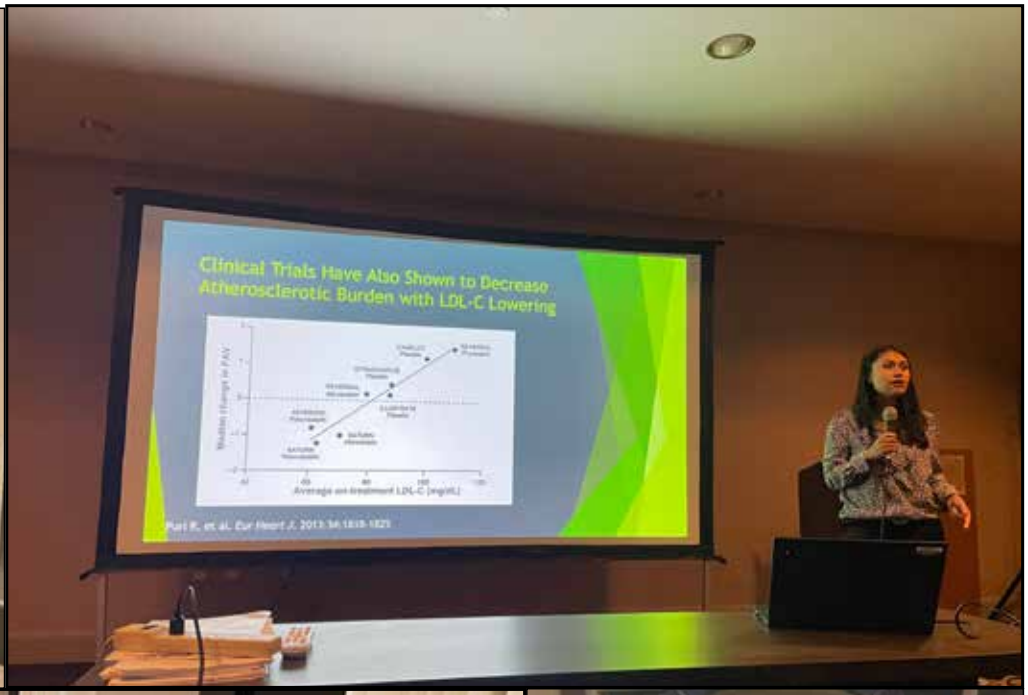
Dr. Lamisa Ahsan

Vice President

articles

Glimpses from Convention 2022

Glimpses from Convention 2022



The Molecular Basis, Symptoms and Treatments of Thalassemia

Mariam Moazzem Bhuiyan, MD, MPH

Thalassemia refers to a class of autosomal recessive disorders that affect hemoglobin, and is among the most common genetic diseases in the world. In thalassemia, the production of one or more globin chains in hemoglobin is decreased or non-existent, but the chains that are produced are structurally normal. Therefore, thalassemia differs from hemoglobinopathies such as sickle cell anemia, where the hemoglobin chains produced are abnormal (Fucharoen and Winichagoon, 2002).

Hemoglobin is a tetrameric protein with four peptide chains held together by non-covalent bonds. Adult hemoglobin (HbA) contains two identical alpha chains with 141 residues in each chain, and two identical beta chains with 146 residues in each chain (Figure 2 and Figure 3). Each alpha chain is in contact with both beta chains, and hemoglobin is often described as a pair of identical αβ dimers, $\alpha_1\beta_1$ and $\alpha_2\beta_2$ (Figure 4). The main function of hemoglobin is to carry oxygen from the lungs to the tissues, and the ability of hemoglobin to bind to oxygen depends on a prosthetic group called heme. The heme group contains a tetrapyrrole ring called protoporphyrin and an iron atom lies in its center. The heme group also has four methyl groups, two vinyl groups and two propionate side chains attached to the tetrapyrrole ring. Each peptide chain in hemoglobin contains a heme group, and therefore there are four binding sites of oxygen in hemoglobin. When oxygen binds to hemoglobin, there is a substantial change in conformation from the T state (deoxyhemoglobin) to the R state (oxyhemoglobin). The $\alpha_1\beta_1$ and $\alpha_2\beta_2$ dimers rotate about 15 degrees with respect to each other, and this change in the quaternary structure of hemoglobin increases the affinity for subsequent oxygen molecules to bind to it (Berg, 2010). Fetal hemoglobin (HbF) is structurally different from adult hemoglobin, and has two alpha and two gamma chains. The transition from gamma globin synthesis (HbF) to beta globin synthesis (HbA) begins before birth, and when a healthy infant is about six months old, almost all the hemoglobin will be HbA (Muncie and Campbell, 2009).

Thalassemia can be broadly classified into beta-thalassemia and alpha thalassemia, depending on which chain of hemoglobin the defect appears. Humans have two alleles which code for the beta chains in hemoglobin and they are located on the two copies of chromosome 11. When only one allele is affected, there is a very slight reduction in hemoglobin production and it is known as beta thalassemia minor. This is mostly asymptomatic, and occasionally the patient might suffer from mild hypochromic,

microcytic anemia: a condition in which red blood cells are smaller and paler (Muncie and Campbell, 2009).

The disease is more severe if both the beta globin chains are affected: if the production of the beta chains is reduced, it is known as beta thalassemia intermedia, whereas if the production of the beta chains is entirely eliminated, it is known as beta thalassemia major (Cooley's anemia). Point mutations and small deletions or insertions in the nucleotide sequences are mainly responsible for the molecular defects of beta thalassemia, and about 200 different types of mutations have been detected in populations all over the world. Thalassemia intermedia is caused due defects in RNA processing or in promoter region of the gene, or due to a mutation within introns, which result in reduced beta globin production. Thalassemia major is often caused due to a mutation which causes complete block at transcription or RNA processing, leading to the lack of beta globin mRNA production (Figure 1, Kazazian and Boehm, 1988).

In the absence or reduction of beta chains, the alpha chains form insoluble aggregates which precipitate inside immature red blood cells and cause them to die prematurely, leading to hemolytic anemia. The hemolytic anemia stimulates erythropoietin production, resulting in massive erythropoiesis. Due to this huge production of red blood cells, the bone marrow expands and results in brittle bones, which fracture easily. The spleen in a thalassemic patient is overworked and enlarged because it has to continuously filter a large amount of destroyed or aged blood cells and this condition is known as splenomegaly. Thalassemic patients also suffer from jaundice due to iron overload, and cardiac failure is the cause of death of about half of thalassemic patients, mainly due to deposition of iron in the heart (Fucharoen and Winichagoon, 2002).

Unlike the beta globin chain which was coded by two alleles on chromosome 11, humans have four alleles which code for the alpha chains in hemoglobin and they are located adjacent to each other on the two copies of chromosome 16. A variety of point mutations can cause alpha thalassemia and the occurrence of the mutant genes varies in different countries. A study showed that in the Thai population alone there are at least 18 different types of chromosomes carrying independent alpha- thalassemia mutations. Most commonly, alpha thalassemia results from deletions in $-\alpha^{3.7}$ and $-\alpha^{4.2}$, originating from unequal crossover events in the alpha globin gene cluster (Winichagoon, et al. 1984).

The severity of alpha thalassemia depends on how many alleles are deleted or affected. Where a

single allele is deleted, and there is no discernible abnormality and this is called the silent carrier state. When two alleles are deleted, there is a very slight reduction in hemoglobin production and it is known as alpha thalassemia trait. This is mostly asymptomatic, and occasionally the patient might suffer from mild hypochromic, microcytic anemia: a condition in which red blood cells are smaller and paler (Muncie and Campbell, 2009).

When three of more alpha globin alleles are deleted, the condition is known as Hemoglobin H disease. The relative abundance of beta globin chains in the cell causes the extra beta globin chains to cluster together and form tetramers, and these tetramers have a higher affinity for oxygen than normal hemoglobin, and result in poor oxygen delivery to tissues. Furthermore, the beta globin chain tetramers form precipitates in the red blood cell cytoplasm, known as Heinz bodies. The membrane permeability is thereby decreased causing premature red blood cell lysis, and therefore patients suffer from hemolytic anemia (anemia caused due to low number of red blood cells). Some of the symptoms and clinical conditions of Hemoglobin H disease are similar to that of beta thalassemia, such as massive erythropoiesis, splenomegaly, and jaundice, but Hemoglobin H is usually less severe than both beta thalassemia major and beta thalassemia intermedia (Fucharoen and Winichagoon, 2002).

When all four alleles for alpha globin chains are deleted, there is hardly any production of hemoglobin and this disease is known as alpha-thalassemia major. The symptoms of alpha thalassemia major appear quite early in fetuses, because the alpha chains are present in both fetal and adult hemoglobin. The relative excess of gamma chains causes the formation of tetramers which damage red blood cells. These tetramers also have a higher affinity for oxygen than normal hemoglobin, and result in poor oxygen delivery to tissues. The severe anemia due to lack of hemoglobin causes congestive heart failure and massive total body edema, a condition known as Hemoglobin Bart's hydrops fetalis. Alpha thalassemia major is the most severe among the different types of thalassemia, because affected individuals often die before birth, and can cause maternal complications during the pregnancy. However, studies have shown that the outcome of about 20 affected individuals who received intrauterine therapy was significantly better and lived for quite a few years (Lucke, et al. 2005).

After alpha thalassemia major, beta thalassemia major is the next most severe form of thalassemia. Unlike people with alpha thalassemia major, people with beta thalassemia major are almost never symptomatic at birth because of the presence of fetal hemoglobin, which has two alpha chains and two gamma chains and can transport oxygen. However, as the transition from fetal to adult hemoglobin

becomes almost complete by six months of age, symptoms begin to appear. In patients affected with beta-thalassemia major and alpha thalassemia major, regular red blood cell transfusions are needed to compensate for bone marrow expansion, prevent the complications of anemia, allow normal development throughout childhood, and extend survival in patients. However, RBC transfusions result in massive accumulation of iron, and since iron unbound to storage or transport proteins is very toxic, this can be fatal without iron chelation treatment (Olivieri, and Brittenham, 1997).

In normal individuals, the tight binding of plasma iron to the transport proteintransferrin prevents the catalytic activity of iron in free radical production. In a patient having very high levels of iron, transferrin becomes fully saturated and a nontransferrin-bound iron is formed, which might accelerate the formation of free hydroxyl radical, facilitate uptake of iron by tissues and cause toxicity. An iron-chelating agent can bind nontransferrin-bound iron over long periods of time, and thus decreases tissue uptake of iron and iron-catalyzed toxic reactions. The most commonly used iron chelating drug is deferoxamine. The treatment is accomplished by subcutaneous injection over a period of 8–12 hours each day. Since this is an inconvenient, time-consuming procedure with several side effects, it often results in non-compliance among patients, and thus scientists sought to discover drugs which could be taken more easily (Olivieri, and Brittenham, 1997).

One such drug is deferiprione, which is an oral iron chelator. Research has shown that deferiprione results in more significant reduction in iron levels in those with a higher iron burden than those with a less significant iron overload. Additionally, it has been demonstrated that combination of two different drugs: oral deferiprone with subcutaneous deferoxamine was quite effective in lowering iron burden. However, the side effects of deferiprione include agranulocytosis, which is a severe lack of white blood cells. This suppresses immune system and causes people to be at high risk of serious infections, and therefore the usage of this drug is not approved in the United States, although it is used in Europe and other countries. Another drug, deferasirox has been recently developed and research shows that it was effective and resulted in statistically significant decreases in liver iron concentrations. Some side effects such as acute renal insufficiency and gastrointestinal problems have been reported, and research for finding a safe, oral iron chelator is currently undergoing (Olivieri, and Brittenham, 1997).

Research is also being done to discover permanent cures for thalassemia major dieseases, and one such cure is bone marrow transplant, which has been carried out successfully around the world. If a brother or a sister who has an identically matched tissue type, called HLA type donates bone marrow,

the production of hemoglobin in the patient rises significantly, and unless there are complications in the surgery, the patient is likely to lead a normal life. Another method that has been successful is using newborn sibling umbilical cord blood. The blood from the placenta which is otherwise discarded after birth contains stem cells that can go on to make bone marrow for the affected sibling. Thus the production of hemoglobin increases, and this treatment is in many ways, a safer source of donor cells than bone marrow transplant. Other possible treatments that are being researched include gene therapy techniques which hope to increase the amount of normal hemoglobin the body can produce (Fucharoen and Winichagoon, 2002).

Although thalassemia is often a life-threatening disease, research has shown that thalassemia carriers have a selective advantage against malaria. The mechanism for this has not yet been completely understood, but it has been shown that thalassaemic red blood cells bind to greater amounts of immunoglobulin than healthy blood cells. Binding of antibody increases exponentially during parasite maturation, and thus causes clearance of parasitized erythrocytes (Luzzi, 1991). This probably explains why although thalassemia has been found in almost every population, it most common in the Mediterranean, Middle East, South Asia, South-East Asia, and Africa, where malaria is prevalent. Furthermore, it has also been shown that alpha-thalassemia, beta-thalassemia and sickle cell anemia, might have protective effects on each other, despite being inherited independently (Kulozik, *et al*. 1988). More research is undergoing on the mechanisms underlying the relationship of thalassemia with other diseases, and it is hoped that understanding the molecular basis of the different types of thalassemia will enable more effective treatments to be developed in the near future.

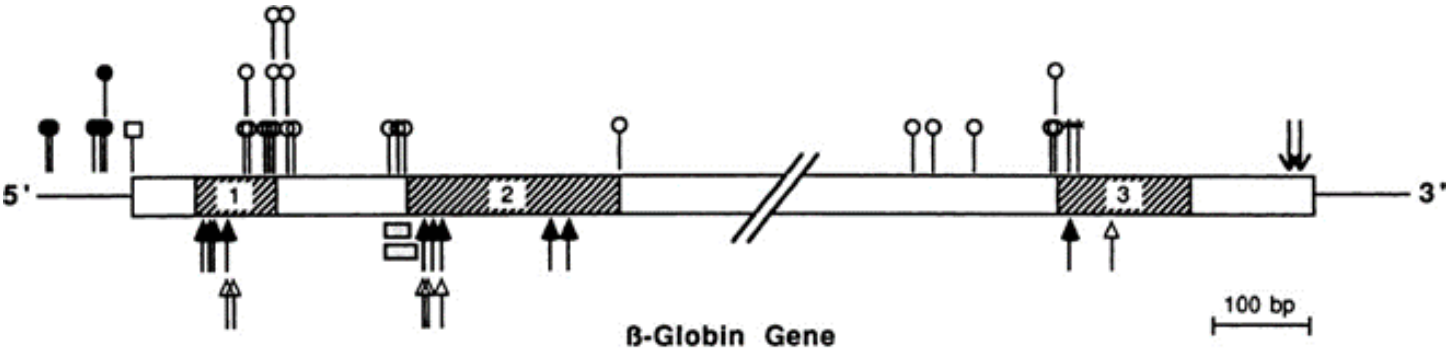


Fig 1. Point mutations in β-thalassemia. The β-globin gene is shown with numbered hatched areas representing the coding regions of exons. Boxed open areas between the exons are introns, and boxed open areas at the 5′ and 3′ ends of the gene are untranslated regions that appear in the messenger RNA. The various types of mutations are depicted by different symbols. For example, 22 of the 51 mutations affect RNA splicing and are shown as ⚲′ . (⚲), transcription: (⚲), cap site: (⇣), RNA cleavage: (⚲), frameshift: (⚲), nonsense codon: (⚲), unstable globin; (▭), small deletion.

(Kazazian and Boehm C.D., 1988)

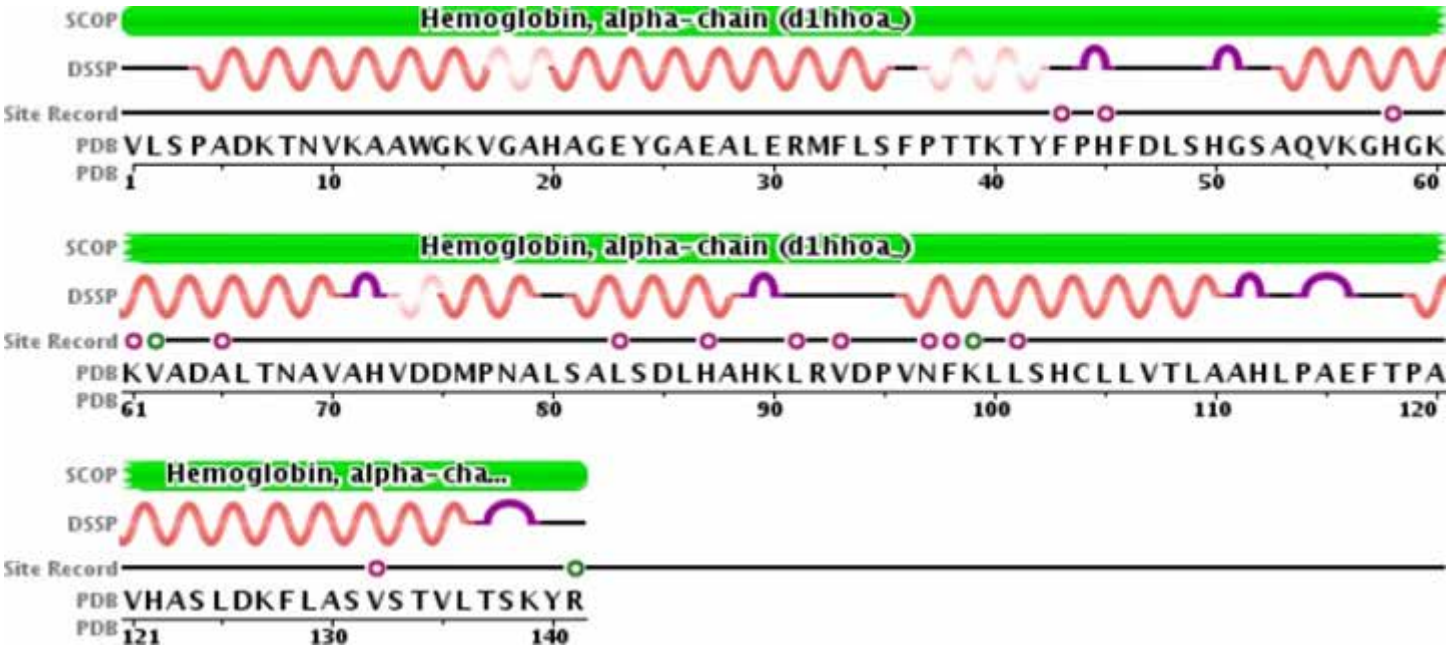


Figure 2: Primary structure of alpha hemoglobin (PDB: 2HHB)

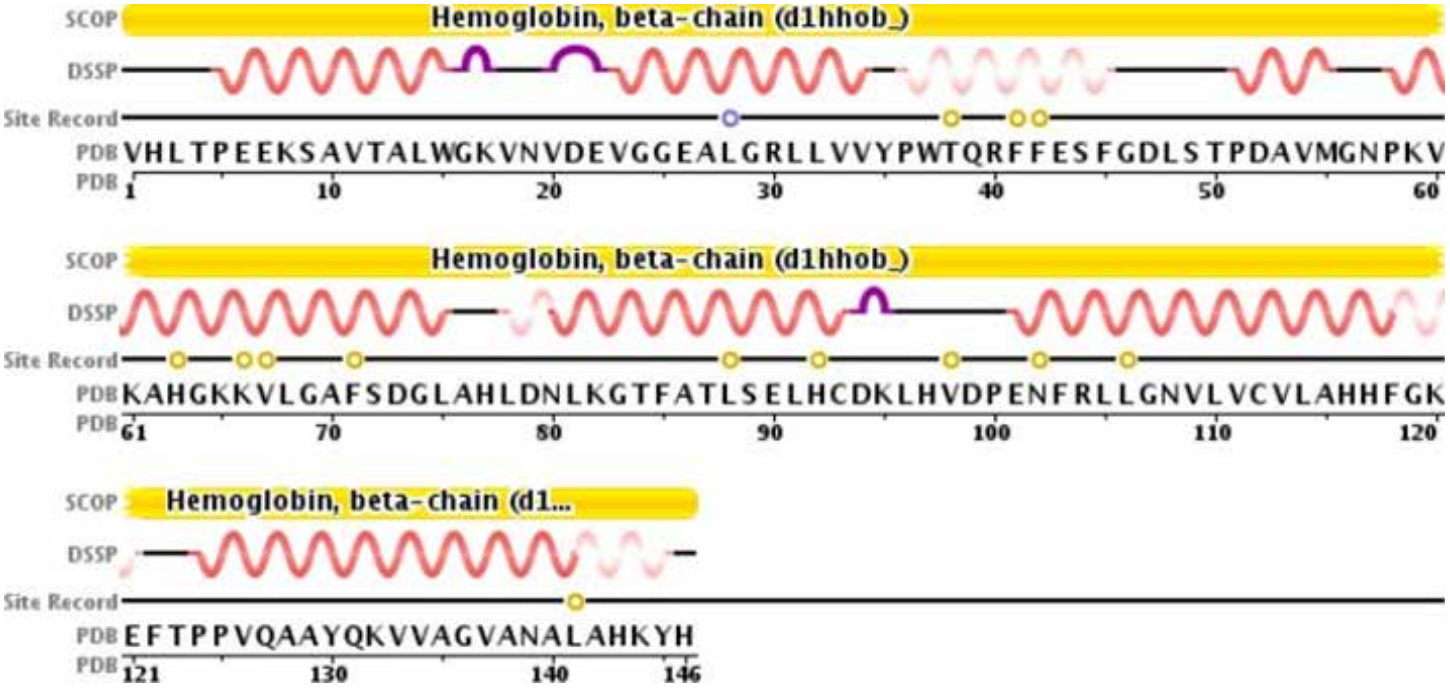


Figure 3: The primary sequence of the beta globin chain (PDB: 2HHB)

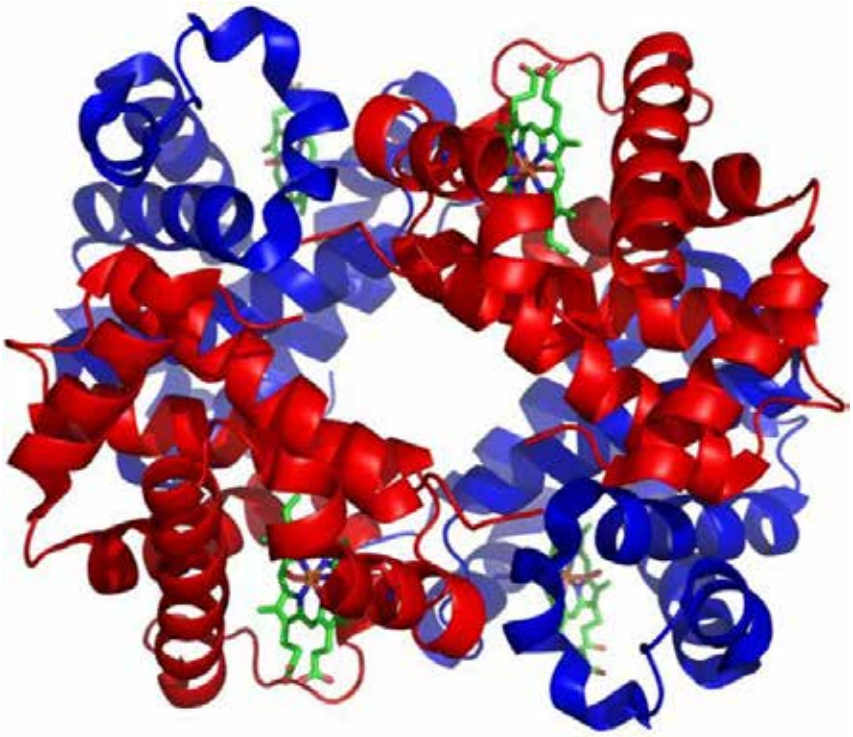


Figure 4: Structure of human hemoglobin. The α and βsubunits are in red and blue, and the iron- containing heme groups in green. (PDB:1GZX)

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Clinically useful tumor fluorescence greater than 24 hours after 5-aminolevulinic acid administration

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ABSTRACT

Background: 5-aminolevulinic acid (5-ALA) is a valuable surgical adjuvant used for the resection of glioblastoma multiforme (GBM). Since Food and Drug Administration approval in 2017, 5-ALA has been used in over 37,000 cases. be current recommendation for peak efficacy and intraoperative fluorescence is within 4 h after administration. bis narrow time window imposes a perioperative time constraint which may complicate or preclude the use of 5-ALA in GBM surgery.

Case Description: bis case report describes the prolonged activity of 5-ALA in a 66-year-old patient with a newly diagnosed GBM lesion within the left supramarginal gyrus. An awake craniotomy with language and sensorimotor mapping was planned along with 5-ALA fluorescence guidance. Shortly, after receiving the preoperative 5-ALA dose, the patient developed a fever. Surgery was postponed for an infectious disease workup which proved negative. be patient was taken to surgery the following day, 36 h after 5-ALA administration. Despite the delay, intraoperative fluorescence within the tumor remained and was sufficient to guide resection. Postoperative imaging confirmed a gross total resection of the tumor.

Conclusion: be use of 5-ALA as an intraoperative adjuvant may still be effective for patients beyond the recommended 4-h window after initial administration. Reconsideration of current use of 5-ALA is warranted.

Keywords: 5-ALA, 5-Aminolevulinic acid, GBM, Glioblastoma multiforme

INTRODUCTION

High-grade gliomas (HGG) represent the most common primary intracranial tumor with an estimated 13,000–17,000 newly diagnosed cases each year.[17,20,21,29] Despite modest survival benefit with adjuvant therapies such as chemo-radiation and tumor-treatment fields, long-term prognosis with HGG is invariably discouraging with 1- and 2-year survival rates of 38% and 16%, respectively.[3] The preponderance of evidence suggests that the extent of resection (EOR) correlates strongly with survival. be use of advanced surgical adjuncts, such as intraoperative magnetic resonance imaging (MRI), and

fluorescence-guided surgery (FGS), has shown promising results. Numerous RCTs have demonstrated that both tools increase EOR with an associated increase in progression-free survival.[18,22,24]

Since the US Food and Drug Administration's approval of 5-aminolevulinic acid (5-ALA) in February 2017, over 37,000 patients with glioblastoma multiforme (GBM) have been operated on with the aid of FGS. be current recommended dose of 5-ALA is 20 mg/kg body-weight, administered orally 2–4 h before induction of anesthesia.[15] bese recommendations arise from preclinical animal studies[23] and Phase I and 2 dose-escalation trials,[4,15,16] with additional support from a randomized, prospective, and double-blind study of alternative dosage regimens for HGG resection.[25]

5-ALA is a prodrug with selective intracellular conversion to protoporphyrin IX, the fluorescent downstream metabolite of 5-ALA that preferentially accumulates in high-grade tumor cells to glow under blue-light illumination.[8,12,16,23] *In vivo* animal studies report peak fluorescence between 1.5 and 4 h after administration,[19,23] yet, clinical experience has demonstrated visually discernible tumor fluorescence even 12–16 h after initial dosing.[7,13,28] While those instances of prolonged fluorescence have been informally described, we present the first reported case of clinically useful intraoperative tumor fluorescence >24 h after 5-ALA administration, without redosing.

CLINICAL PRESENTATION

A66-year-old right-handed male initially presented with mild cognitive difficulty, dysphasia and progressive difficulty walking. On examination, a subtle neglect, acalculia, extinction to double simultaneous stimuli, and right-sided apraxia were noted. Evaluation with MRI demonstrated a partially cystic contrast-enhancing mass in the dominant supramarginal gyrus with fluid-attenuated inversion recovery positive signal intensity extending above to the superior parietal lobule, suggestive of glioma [Figure 1]. An electroencephalogram showed cortical irritability on the left but no definite seizures. His symptoms improved with levetiracetam and dexamethasone, which he continued until surgery. Given the eloquent location of his tumor, the surgical plan included an awake language and sensorimotor mapping using phase reversal and cortical and subcortical motor-evoked potentials to preserve function. We also elected to make use of 5-ALA and intraoperative MRI to maximize resection.

On arrival to the preoperative area, a 20 mg/kg oral dose of 5-ALA was given at 5:50 AM, within 2 h of surgery. Before transport to the operative suite, the patient developed a fever of 38.8°C, which increased to 39.4°C on repeat evaluation. After consultation with our clinical trials team and anesthesia,

surgery was deferred in favor of further evaluation of the cause of the fever. He was transferred to the intensive care unit and kept under light precautions in the interim. His fever was self-limiting. Further evaluation revealed no infectious etiology. Surgery was rescheduled for the following morning at 9:30 AM, more than 24 h after administration of 5-ALA.

During surgery, cortical mapping demonstrated several areas critical for language function. be non-enhancing lesion was found to be in an area that, when stimulated, resulted in movement of the opposite arm and face as well as dysesthetic pain in a similar distribution. After cortical mapping and partial white light resection, the first utilization of fluorescence came a full 32 h after 5-ALA administration [Figure 2]. be cystic enhancing and fluorescent tumor were removed and sent for pathologic analysis [Figure 3]. Further molecular characterization demonstrated: Grade 3 Diffuse Astrocytoma; IDH wild-type, MIB index 7%; and MGMT promotor methylation. Postoperatively, no focal neurological deficits were identified. MRI obtained on postoperative day 2 showed resection of the enhancing lesion and

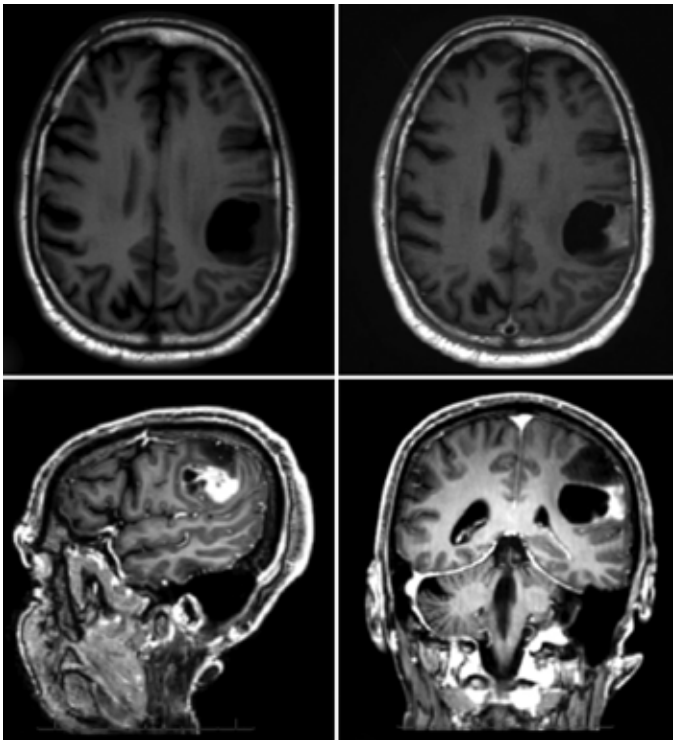

Figure 1: Preoperative magnetic resonance imaging (MRI) of the brain with and without contrast demonstrating contrast-enhancing left parietal cystic lesion. (a) Axial MRI T1-weighted, (b) axial T1-weighted with gadolinium, (c) sagittal T1-weighted with gadolinium, and (d) coronal T1-weighted with gadolinium.

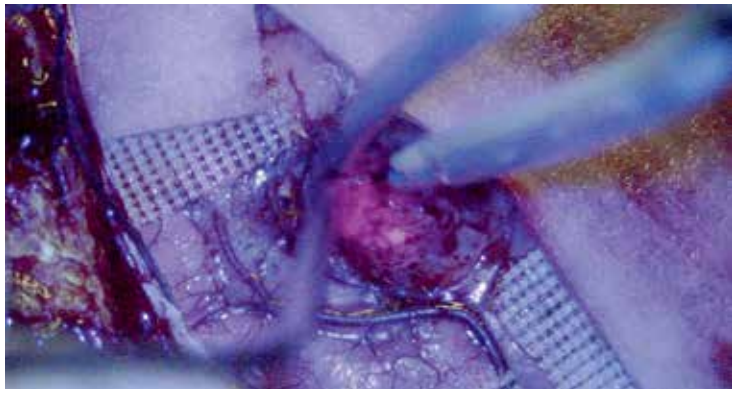

Figure 2: Intraoperative view of fluorescent, pathologic tissue visualized through a small corticotomy window. Photo taken at the onset of the resective portion of the surgery, approximately 33 h after administration of 5-aminolevulinic acid. Normal brain parenchyma did not fluoresce and all pathologic specimens that fluoresced were positive for tumor.

non-enhancing residual T2 hyperintense suspected disease at the superior margin [Figure 4].

IRB approval was not obtained as this is a case report, negating the requirements for review. be patient's identity was not disclosed or compromised.

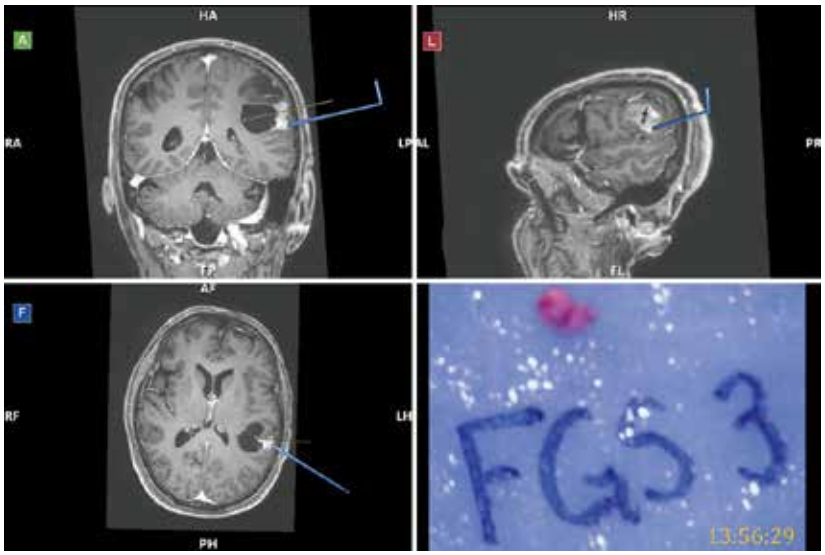

Figure 3: Intraoperative navigation depicting location of biopsy sample and visualized fluorescence under blue-light illumination in the (a) coronal plane, (b) sagittal plane, (c) axial plane, and (d) microscope luminescence control window. be time stamp indicates approximately 32 h after initial administration of 5-aminolevulinic acid. be blue lines in (a), (b), and (c) indicate location of fluorescent biopsy sample depicted in (d).

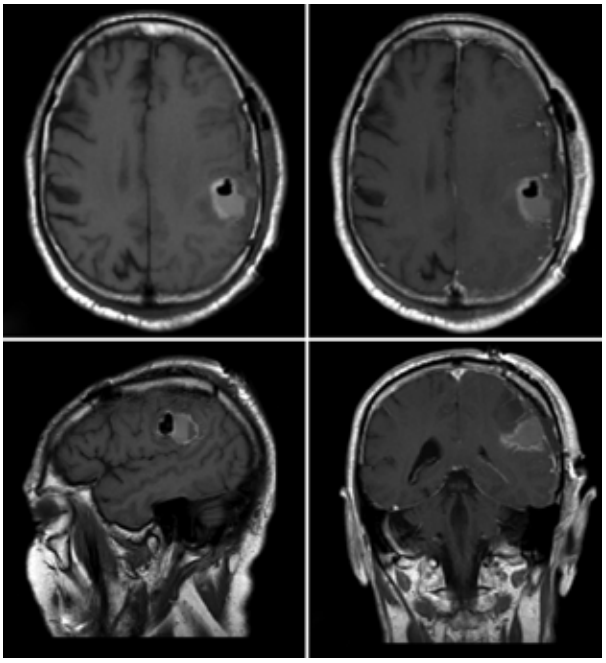

Figure 4: Postoperative T1-weighted (a and c) pre-contrast and (b and d) post-contrast magnetic resonance imaging demonstrating complete removal of the contrast-enhancing tumor.

DISCUSSION

The use of 5-ALA FGS as an adjunct for visualization and resection of GBM was approved in June 2017. Since then, there have been multiple articles reporting the efficacy, dosing, and outcomes relative to the volume of tumor resected.[5,8] However, there is limited information regarding the upper temporal limits of sufficient brain tissue fluorescence at the recommended dose of 20 mg/kg.

The rationale for exogenous 5-ALA administration 2–4 h before anesthetic induction is predicated on both the aforementioned dose-response studies and the likelihood that anesthetic administration, patient positioning, setup, craniotomy, and initial macroscopic white-light tumor debulking constitute the initial 3–4 h time period after 5-ALA administration, with the anticipated microscopic blue-light tumor resection occurring in the 4–7 h time frame after dosing.[2,26,27] Expert opinion has further cautioned that if surgery is unexpectedly delayed, one should not cancel surgery strictly on the basis of non-adherence to the classically described fluorescence time window.[28]

ALA is an endogenous metabolite of the mitochondria, which is further metabolized to produce protoporphyrin IX (PpIX). Exogenous/oral 5-ALA is thought to be preferentially metabolized by cells that undergo a high rate of proliferation (i-67, MIB-1 index, and WHO grade).[10,15] The accumulation of the metabolite PpIX allows for intraoperative fluorescence under deep blue light (wavelength filter of 375–440 nm), thereby providing differentiation of high-grade glial tissue from normal parenchyma. be current recommended time to surgery after oral administration of 5-ALA is 2–4 h. Industry-sponsored clinical studies have shown a mean halflife of 0.9 (0.8–1.3) h at the recommended dose, while the maximum concentration of PpIX metabolite was found to occur at a median value of 4 (1.2–7.8) h.[14] Dose-dependent analysis performed by Michael et al. also suggests that increasing doses of 5-ALA are associated with higher rates of gross total resection with lower residual tumor volume when compared to standard dosing in patients with GBM. However, to the best of the authors' knowledge, there are no studies comparing the fluorescence intensity of brain tissue as a function of time after administration or plasma concentration of 5-ALA.[15,16]

There are many factors that can affect the active metabolic plasma concentration of 5-ALA, including antibiotics and seizure medications such as phenytoin.[6,16] However, our patient did not receive antibiotics before his fever episode instead receiving a standard perioperative first-generation cephalosprin shortly before incision on the day of the surgery. be patient had no remote history of medication use that would affect elimination (including Keppra), nor evidence of hepatorenal dysfunction that would prolong the excretion of 5-ALA. *In vitro* studies of the WHO Grade 3, human glioma cell lines have shown that *IDH1* mutation is associated with a delay in 5-ALA metabolism and consequent fluorescent activity; however, our patient was found to be *IDH1* wildtype. [Figure 3] depicts a fluorescent tissue sample at 32 h post 5-ALA dosing, the longest reported example of its kind.

Irrespective of the degree of metabolic clearance, tumor fluorescence with 5-ALA is often heterogeneous.[5] Solid tumor will fluoresce as red, whereas vaguely fluorescent pink tissue beyond the border of MRI T1-Gd enhancement has been described to represent infiltrating tumor both with positive predictive values >92%.[5,7] [Figure 2] depicts tumor fluorescence between 24 and 33 h after initial 5-ALA dose. Factors that may limit visualization of tissue fluorescence include the depth and breadth of the surgical bed and their subsequent impact on the amount of excitatory blue light that can be delivered to the metabolite PpIXcontaining tumor tissues. In addition, photobleaching with prolonged illumination can limit visualization of fluorescent tumor.[1,2,9,11] While the ongoing degradation of photoactive PpIX cannot be excluded, the resection of weakly fluorescent and non-fluorescent tissue should still be considered

with MRI, intraoperative neuronavigation, and direct visualization of abnormal tissue without damage to eloquent brain tissue.

CONCLUSION

The prospect of working outside the recommended 2–4 h time frame from the administration of 5-ALA to induction of anesthesia allows for greater flexibility in the event of unanticipated scheduling constraints. Our findings also raise the plausibility of whether patients may take 5-ALA the evening before surgery as opposed to 3–5:00 AM the day of surgery. Further evaluation of the temporal characteristics of tissue fluorescence following 5-ALA administration in humans undergoing brain tumor resections would be of value.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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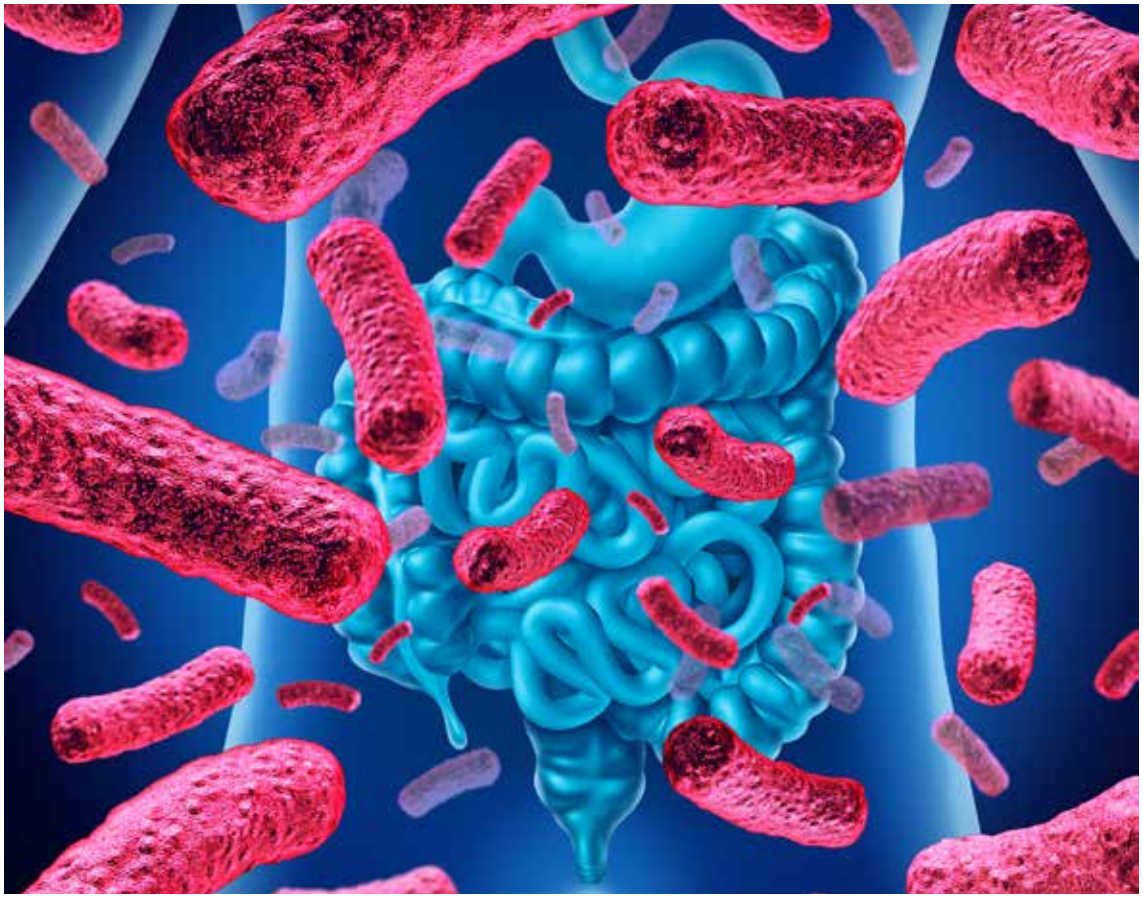
Unraveling gut microbiota: The missing link to a healthy mind, healthy weight, immunity and happiness

How food, medicine and lifestyle affects the human microbiome.

Kazi M Anam MS, R.Ph., ND



The human body is a fascinating ecosystem comprised of trillions of microorganisms, and among them, gut bacteria play a crucial role in maintaining our overall health and well-being. Over the past few decades, extensive research has shed light on the importance of these microscopic organisms, revealing their impact on digestion, immune function, metabolism, body weight, mental health, and even chronic disease prevention. This article explores the world of gut bacteria and their vital contributions to our health.

Gut bacteria, also known as gut microbiota or gut flora, refer to the diverse community of microorganisms residing in our gastrointestinal tract, primarily the large intestine. This complex ecosystem consists of various bacteria, viruses, fungi, and archaea, each playing distinct roles in shaping our health. The composition of gut bacteria is unique to every individual, influenced by genetics, diet, environment, and lifestyle choices.

Digestion and absorption:

One of the primary functions of gut bacteria is aiding in the digestion of food and absorption of nutrients. Certain species of gut bacteria break down complex carbohydrates, fibers, and proteins that the human body cannot digest independently. Through fermentation, these microbes produce essential nutrients like short-chain fatty acids, which promote intestinal health and reduce inflammation. Moreover, gut bacteria help in the absorption of vitamins, such as B vitamins and vitamin K, supporting overall well-being.

Gut bacteria and immune system:

A healthy balance of gut bacteria is crucial for maintaining a robust immune system. The gut acts as a barrier between the external environment and our bodies, and gut bacteria play a significant role in training and regulating the immune response. They interact with the cells of the intestinal lining and help prevent the invasion of harmful pathogens. Imbalances in gut bacteria, such as dysbiosis, can lead to immune dysfunction, making individuals more susceptible to infections and autoimmune diseases.

Gut bacteria and body weight:

Research has highlighted the intriguing link between gut bacteria and metabolism. Certain species of gut bacteria can influence how our bodies extract and store energy from food, impacting weight management. Studies have revealed that an imbalance in gut bacteria may contribute to obesity and metabolic disorders. On the other hand, a diverse and balanced gut microbiota seems to promote a healthy metabolism and reduce the risk of obesity-related health issues.

Gut bacteria and mental health:

The gut-brain axis is a fascinating connection between the gut and the brain, and gut bacteria play a significant role in this communication network. Studies have indicated that gut bacteria can influence brain function and behavior through various mechanisms, including the production of neurotransmitters and immune signaling molecules. An imbalanced gut microbiome has been associated with an increased risk of mood disorders, such as anxiety and depression. This highlights the potential of gut bacteria as a therapeutic target for mental health interventions.

Preventing chronic diseases:

Beyond the aforementioned aspects, gut bacteria have also shown promising effects on preventing chronic diseases. The production of short-chain fatty acids by certain gut bacteria has been linked to a

reduced risk of inflammatory bowel diseases, such as Crohn's disease and ulcerative colitis. Additionally, a balanced gut microbiome may help lower the risk of cardiovascular diseases, type 2 diabetes, and certain cancers.

Maintaining healthy gut microbiome:

Maintaining a healthy gut microbiome requires conscious efforts. Consuming a diverse and plant-based diet rich in fiber promotes the growth of beneficial gut bacteria. Fermented foods like yogurt, kefir, sauerkraut, and kimchi are also excellent sources of probiotics, live microorganisms that confer health benefits when consumed in adequate amounts. Avoiding excessive use of antibiotics and minimizing stress can also help preserve a healthy balance of gut bacteria.

Prebiotic foods:

Consuming prebiotic foods offers a myriad of health benefits. Improved digestion is a prominent advantage, as prebiotics help regulate bowel movements and reduce the risk of gastrointestinal disorders. These foods aid in nutrient absorption, particularly minerals like calcium and magnesium, and support the synthesis of essential vitamins within the gut.

Moreover, prebiotics positively influence the immune system by enhancing the function of immune cells in the gut lining. This, in turn, strengthens the gut barrier, preventing the invasion of harmful pathogens and promoting overall immune health.

Several everyday foods are rich sources of prebiotics. Inulin and fructooligosaccharides (FOS) are prevalent prebiotic fibers found in foods such as onions, garlic, leeks, and asparagus. Chicory root and Jerusalem artichokes are also high in inulin. Additionally, bananas, oats, whole grains, and legumes contain resistant starch, another type of prebiotic fiber. Including these foods in our diet can help nurture a thriving and healthy gut microbiome. So it is essential to incorporate a variety of prebiotic foods into our diets. It is very important to select a diverse range of prebiotic foods, including vegetables, fruits, and whole grains, to nourish the existing beneficial gut bacteria. Complement this with probiotic-rich fermented foods to introduce new beneficial strains into the gut.

Probiotics:

Probiotic foods, on the other hand, contain live beneficial microorganisms that confer health benefits when consumed in adequate amounts. These foods introduce beneficial bacteria directly into the gut, helping to balance the microbiome and counteract the effects of harmful bacteria. Regular consumption

of probiotics has been associated with improved digestion, reduced inflammation, and strengthened immunity.

Fermented foods are excellent sources of probiotics and have been consumed by various cultures for centuries. Yogurt, kefir, and traditional buttermilk are rich in beneficial bacteria like Lactobacillus and Bifidobacterium. These probiotics aid in breaking down lactose, making them suitable for lactose-intolerant individuals. Fermented vegetables like sauerkraut, kimchi, and pickles also harbor diverse strains of beneficial bacteria, providing an array of health benefits.

The health of our gut microbiome influences not only digestive health but also our overall well-being. An imbalanced gut microbiome, known as dysbiosis, has been linked to various health conditions, including irritable bowel syndrome (IBS), inflammatory bowel diseases (IBD), obesity, and even mental health disorders.

Common medications that affect gut microbiome:

Several medications can potentially interfere with gut bacteria (the microbiota) due to their effects on the gastrointestinal system. Some medications can alter the composition and diversity of gut bacteria, which may have implications for health. Here are a few examples of medications that can impact gut bacteria:

- **Antibiotics:** Antibiotics are known to disrupt the balance of gut bacteria. While they are important for treating bacterial infections, they can also kill beneficial bacteria in the gut, leading to imbalances that might result in gastrointestinal disturbances like diarrhea and overgrowth of harmful bacteria like Clostridium difficile (C. diff).

- **Proton Pump Inhibitors (PPIs):** PPIs are commonly used to reduce stomach acid production and treat conditions like gastroesophageal reflux disease (GERD). Prolonged use of PPIs may alter the gut microbiota by affecting the acidity of the stomach, which can impact the growth of certain bacterial species.

- **Non-Steroidal Anti-Inflammatory Drugs (NSAIDs):** NSAIDs, such as ibuprofen and aspirin, can irritate the lining of the stomach and intestines, potentially affecting the balance of gut bacteria.

- **Laxatives:** Some types of laxatives, particularly those that stimulate bowel movements, can affect gut transit time and potentially impact the gut microbiota.

- **Steroids:** Long-term use of steroids, such as corticosteroids, can influence the immune response in the gut and impact the composition of gut bacteria.

- **Chemotherapy Drugs:** Some chemotherapy drugs can alter the gut microbiota, leading to gastrointestinal side effects and potential disruptions in the balance of beneficial bacteria.

- **Antidepressants:** Some studies suggest that certain antidepressants might have an impact on gut bacteria, although more research is needed to fully understand the relationship.

It's important to note that the effects of medications on the gut microbiota can vary from person to person, and not everyone will experience the same level of disruption. Additionally, the gut microbiota is highly resilient and can often recover after a period of disruption once the medication is discontinued.

If you have concerns about how a specific medication might be affecting your gut health, it's best to discuss this with your healthcare provider. They can provide personalized guidance and recommendations based on your individual health situation. In general it is recommended that after a person needs to take any medication they should take both prebiotic foods and some probiotics to bring the gut bacteria to normal level. Otherwise there is the possibility of many adverse health conditions.

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Comparison of Duration of Bacteremia and Mortality with Methicillin-Resistant Staphylococcus aureus(MRSA)vs Methicillin-Susceptible Staphylococcus aureus (MSSA) Bacteremia: A Retrospective Study

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Setting

A 540-bed university hospital in Long Island, New York

Introduction

It has been suggested that MRSA bacteremia is associated with a higher mortality rate than MSSA bacteremia, perhaps due to decreased effectiveness of antibiotics. However, to our knowledge, no data is available regarding the duration of bacteremia (DOB) between MRSA and MSSA after appropriate antibiotic therapy.

Methodology

A retrospective analysis of patients with positive blood cultures results for MRSA and MSSA, for a 10 months period to compare DOB and mortality. Data were entered into Epi-Info for analysis of risk estimates. The Mantel-Haenszel Chi-squared method was used to assess the significance of testing.

Results

Out of 112 patients with documented Staphylococcus aureus bacteremia, 102 patients (65 MRSA and 37 MSSA) were included in the analysis. 10 patients were excluded due to incomplete data. The overall mortality was 22.1%. There was no significant difference in the mortality between MRSA and MSSA bacteremia (21.2% vs 23.7%, OR 0.86; 95% CI0.33-2.24; p=NS). The duration of bacteremia was longer in MSSA cases when compared to MRSA cases
(mean 5.59 ± 6.63 vs 4.71 ± 4.86 p=NS).

Type of Bacteria	Total Cases	Number of Death	Mean of DOB	OR	P-Value
MRSA	65	14	4.71 ± 4.86	0.86; 95% CI (0.33-2.24)	Not Significant
MSSA	37	9	5.59 ± 6.63		

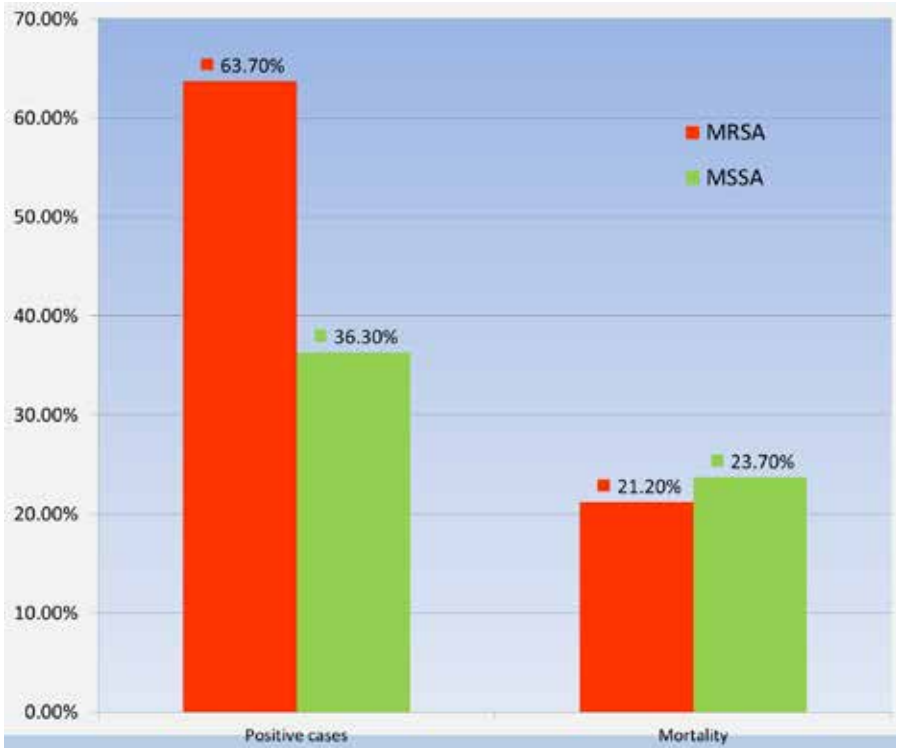

figure 1

Conclusion

In our study, neither the DOB nor the mortality differed between MRSA or MSSA cases. The increased mortality associated with MRSA bacteremia reported in other studies may be due to factors other than decreased effectiveness of antibiotics.

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A Message from the NYCPS President

We are approaching almost 5 months into the Medicaid Fee for Service (FFS) implementation, while there were some minor hiccups mainly with the formulary issues and they seem to be starting to get back on track, is it a perfect? not entirely some brand medications are still reimbursed under water as a result of NADAC pricing.

PSSNY has been in regular contact with DOH with our ongoing issues and are working to remedy any problems we face. We are also hearing concerns from pharmacy owners who operate specialty pharmacies, they are claiming to lose money on high-cost medications. Remember if you get a voluntary request to answer the CMS Myles and Stafford managed pricing survey on your pharmaceutical invoice costs, I urge you to comply, that survey helps create a balanced pricing database for NADAC.

Also, many pharmacy owners are also having issues with their wholesalers, ever since NYRx kicked it we are following their formulary, we are dispensing more brand drugs than before. While everyone has their own relationships with their suppliers, we have been in touch with some major wholesalers in our efforts to explain the new dynamics in the marketplace. These suppliers are now seeing sudden increase of volume and of brand drug purchases. Personally, I was able to increase my credit limit with two of my wholesalers, perhaps you can do the same.

On the political side we still have opposition to the Fee for Service (NYRx) program, 340B entities are still trying to reverse the NYRx program, they have sued the state. It's a law of NYS and it will not be reversed easily. NYC is a big prescription market. Everyone wants financial benefit from it, there will be oppositions whether it's from 340B entities or another group. We need to remain vigilant and active and make sure FFS stays for good. We don't have to worry about it for the time being since the budget has already passed but come January 2024 opposition will knock on our legislator's door again. Get to know your legislators, call them, meet them and take the time to educate them how FFS helps patients, saves money for the state and keeps our door open so we can continue to provide valuable service.

Despite having a very busy week, the last week of June, I managed to drive up to Saratoga Springs and I was able to attend the annual PSSNY convention. There were over 100 members in attendance and more than 25 percent were from the NYC region. I want to thank the NYC members who attended. It was a good event to network with colleagues and the various vendors. If you didn't get a chance to

attend this year's convention, I strongly recommend that you consider attending next year.

The biggest take was the Continuing Education presentation by Trenton Thiede, President of PASS National. He spoke of the Compliance required for PBMs we deal with and in addition he reminded all in attendance about the requirement for such compliance with the Office of the Medicaid Inspector General ("OMIG") on behalf of the Department of Health's Medicaid Program. Remember that OMIG is the state agency that is responsible to conduct Medicaid audits of all Medicaid providers, including pharmacy audits to ensure integrity and accuracy in the billings submitted. We already have to deal with PBM audits and every PBM has their own standards and now we have to focus on compliance with NYS OMIG standards. (Since 2011 Medicaid has not focused on pharmacy activity since the Medicaid Managed Care organizations were handling most of the pharmacy-based claims. Now that we have returned to the fee for service Medicaid program any pharmacy billing over one million dollars per year will be targeted for audits. Now more than ever it's important to train yourself and staff proper way to stay compliant with NY Medicaid policies. You need to have a pharmacy written policy and procedure manual, and you need to have a designated Pharmacy compliance officer, HIPAA privacy officer, and a HIPAA Security Officer all positions which the designated person needs to know how to monitor the pharmacy operations for such compliance and also be able to train the staff with needed guidance in these areas.

On another note, at the PSSNY Convention, I was officially selected as the chairman of RxPac of New York. For the past 4 years I served as the vice chair along with the newly installed PSSNY president Leigh McConchie

If you are not sure about RxPac, it's an independent entity that raises fund for New York State political candidates, and helps foster all pharmacists to get involved with politics. Truthfully speaking our fund-raising for our PAC of New York, which is our Political Action Committee (PAC), have dried up over the past few years, in large part due to the issues relating to COVID 19, which is understandable due to the financial strains we dealt been forced to deal with during the pandemic. But now it seems that our pharmacies should be on stronger financial grounds and I encourage all of you to become a full voting member of RxPac of New York.

Remember how hard we worked to get the Medicaid program back to the Fee for Service (FFS) operation. In the same way, the way FFS program came to us, it can be taken away if we are not active within

our profession.

To get involved in the RxPAC of New York, it's only $300 dollars annual dues in order to become a voting member of the PAC. If you are a pharmacy owner, it is suggested that you make a monthly contribution of $100 dollars per pharmacy. Please visit Pharmacy PAC of New York State (newyorkrxpac.org) for more information. Support your profession, become a voting member today and get involved with pharmacy political influence in Albany.

It was exactly one year ago that the NYCPS Board of Directors decided to hold our first ever trade show in the NYC region. It was a day to remember as we had over 200 attendees that included owners, pharmacists, and vendors. We had the New York Medicaid Pharmacy Director Kimberly Leonard along with Deputy Superintendent of Insurance, Eamon Rock, who is leading the recently created Pharmacy Benefit Bureau (PBB). This year we have a tentative date on October 22nd to hold the event again most likely at St. John's University. And we hope that both honored guests from last year will be able to join us this year to give us new updates on their respective agencies. Stay tuned, more details will be coming soon.

Stay well, stay involved and stay informed.

Mohammed Taher, NYCPS President

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THANK YOU!

On behalf of the BAPA Executive Committee and Executive Board, we would like to thank all of our attendees for joining us in Philadelphia and making our convention a success. We look forward to see you at all upcoming BAPA Events.

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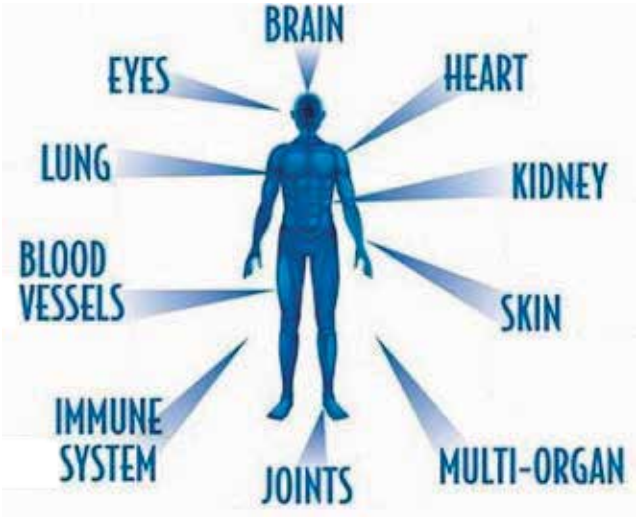

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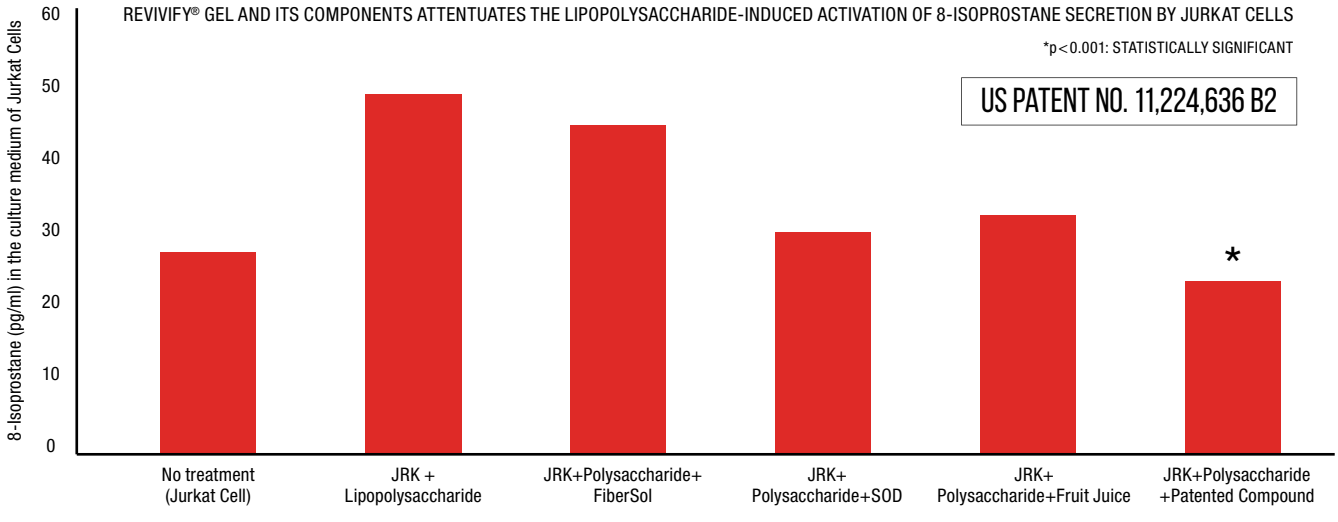

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