Research Article

Could a Simple Barcode Enhance Patient Safety by Raising Awareness of Black Box Warnings? How Can We Bridge the Knowledge Gap in Medication Risks Among Health Professionals?

Amr Ahmed[1], Maher M. Akl[2], Yousef Albaalawi[3]

1. The public health department, Riyadh First Health Cluster, Ministry of Health Saudi Arabia, Riyadh, Saudi Arabia; 2. Department of Chemistry, Faculty of Science, Mansoura University, Egypt; 3. Independent researcher

The knowledge and awareness of health professionals and patients surrounding black box warnings are still gaping. Our target is to find solutions to prevent potential side effects and severe interactions. Black box warnings are the strongest drug safety warnings issued by regulatory authorities, highlighting the potential risks associated with specific medications. However, there is often limited understanding and awareness of these warnings among both healthcare providers and patients, which can lead to inadequate risk management and patient safety. Therefore, closing knowledge gaps and proposing strategies for improving awareness and reducing adverse events related to medications with black box warnings is crucial. As we witness an unprecedented surge in drug discoveries, especially biological drugs for immunological disorders and cancer therapy, growing dramatically and receiving approvals by the FDA, the landscape of healthcare is rapidly evolving. With the remarkable advancements in immunotherapy, particularly the proliferation of monoclonal antibody drugs, we are witnessing a paradigm shift in the treatment of various conditions. However, this surge in drug approvals has brought forth a crucial concern - the increasing prevalence of Black Box Warnings associated with many of these drugs. A Black Box Warning, recognized as the most critical indication of potential serious side effects by the FDA, is typically issued post-marketing. This revelation highlights a significant gap in our understanding, particularly in terms of knowledge and adherence to these warnings by healthcare professionals, including physicians and pharmacists. We suggest the black box warning must have a barcode or

 doi.org/10.32388/32MPC2.2

logo on the outer pack of the drug if it has a black box warning, as this will give an alert for serious side effects or interactions for patient safety and provide an alert for physicians, patients, and pharmacists. Also, we suggest the warning black box drugs must be registered as notes in prescriptions either written or electronic, also registered in electronic prescriptions as a black box with a warning alarm in front of any drug carrying a black box warning, and also in medical records at hospitals and in pharmacist and patient files, as this enhances health outcomes and avoids serious side effects for patient safety.

Corresponding author: Amr Ahmed, drmedahmed@gmail.com

Abbreviations

- FDA: Food and Drug Administration
- BBW: Black Box Warning

Introduction

The history of the Black Box Warning on FDA labels dates back to the 1970s. It was implemented to draw attention to serious or life-threatening risks associated with specific prescription drugs. The purpose of this warning is to ensure healthcare professionals and patients are well-informed about the potential dangers associated with certain medications. The Black Box Warning got its name from the prominent black border that surrounds the text on the drug label, making it easily noticeable. This label indicates that the drug carries significant risks that should not be ignored. [1] Over the years, the number of drugs requiring a Black Box Warning has increased. As of March 2023, there are numerous drugs with this warning due to their potential risks. Some examples include certain antidepressants, antipsychotic medications, opioids, non-steroidal anti-inflammatory drugs (NSAIDs), and medications for treating epilepsy. These drugs may have known risks such as increased suicidal thoughts, heart-related complications, addiction potential, and severe allergic reactions, among others. [2] Additionally, monoclonal antibody drugs also have an increased risk for Black Box Warning. Biological therapy has increased in recent years and is growing for many diseases. Monoclonal antibodies are biological drugs that mimic the body's natural immune system response to fight specific diseases. While they can be highly effective, they are not without potential risks. These risks

often stem from the drug's mode of action, which can include suppressing the immune system and leading to serious infections or other adverse reactions. It's important to note that the presence of a Black Box Warning does not mean that the drug is necessarily unsafe or should be avoided. Healthcare providers carefully weigh the risks and benefits before prescribing such medications, and patients should have open discussions with their doctors to ensure they understand the potential risks and make informed decisions regarding their treatment. In summary, the Black Box Warning is an integral part of FDA labeling that aims to highlight serious risks associated with certain drugs. The number of drugs with this warning has increased over time, and both conventional drugs and monoclonal antibody drugs can pose risks that warrant this strong cautionary label. [3]

The existing literature and cross-sectional studies have inadequately addressed this critical area of concern. Consequently, a notable gap persists in our collective knowledge regarding the awareness of and adherence to Black Box Warnings among healthcare professionals. We must bridge this gap to ensure the well-informed and judicious use of these medications in clinical practice.

Black box warnings are intended to inform healthcare providers and patients about the potential risks and serious adverse effects associated with specific medications. However, studies have shown that these warnings are often overlooked, misunderstood, or not effectively communicated, resulting in preventable harm to patients. This paper explores the significance of closing the knowledge gap surrounding black box warnings and presents an innovative approach to enhance awareness and prevention. [4]

In the past, antipsychotic drugs were more drugs with black box warnings, but with the discovery of monoclonal antibodies and many drugs introduced to markets, the number of black box warnings increased. [5]

From clinical practice examples

From clinical practice, some cases may have deadly side effects because of not reading the black box warning by health professionals or patients.

1. For example, if a patient is on an immune suppressant drug like adalimumab for a specific immune disease for many years and has not been ordered a pre-test for latent tuberculosis before the prescription of monoclonal antibodies against TNF alpha, which has serious side effects such as a black box warning for serious infections like reactivation of tuberculosis, this may be deadly,

as a patient may develop a serious infection if screening for latent tuberculosis is not done. This patient is diagnosed with a fever of unknown origin (missed diagnosis).

2. For example, a patient with psychiatric problems, suffering from depression, was on sertraline, duloxetine, and isotretinoin. Three drugs have black box warnings. Check the FDA label of sertraline; it has a strong black box, including the requirement that the physician must tell the caregiver and the patient at the start of treatment if the patient has worsening symptoms. Suicidal behavior secondary to antidepressant usage like sertraline may happen, as suicidal thoughts or actions may increase in some people 24 years of age and younger, especially within the first few months of treatment or when the dose is changed. Watch for these changes and call your healthcare provider right away if you notice new or sudden changes in mood, behavior, actions, thoughts, or feelings, especially if severe. Pay particular attention to such changes when sertraline is started or when the dose is changed. Keep all follow-up visits with your healthcare provider and call between visits if you are worried about symptoms. You, your family, or your caregiver should call your doctor right away if you experience any of the following symptoms: new or worsening depression; thinking about harming or killing yourself, or planning or trying to do so; extreme worry; agitation; panic attacks; new or worsening anxiety; difficulty falling asleep or staying asleep; aggressive behavior; irritability; acting without thinking; severe restlessness; and frenzied abnormal excitement. Be sure that your family or caregiver knows which symptoms may be serious so they can call the doctor if you are unable to seek treatment on your own. [6]

Why do cigarettes have logos and dangerous drugs do not have logos from the black box warning

Cigarettes are known to cause serious health problems, and the Ministries of Health obligate the product companies to put a logo on the pack of cigarettes to give high attention and a high alert for clients to be careful about these suspected serious side effects.

If cigarettes may, after a long time of use, cause serious health problems and there are logos for the warning, I ask why the US Food and Drug Administration (FDA) may require pharmaceutical companies to include a black box warning on the packaging of certain drugs to be clearly shown on packs of certain drugs like monoclonal antibodies.

Our perspective (barcode or logo)

In light of this, we propose a novel approach to enhance awareness and prevent potential adverse events associated with drugs carrying Black Box Warnings. Closing the knowledge gap on Black Box Warnings is not just a goal; it is a responsibility that we collectively bear to ensure patient safety in the face of evolving therapeutic landscapes. We believe that our proposed approach can catalyze change, ushering in a new era of heightened awareness and adherence among healthcare professionals. We welcome the opportunity to discuss this initiative further and explore potential collaborations. Together, we can make significant strides toward a safer and more informed healthcare environment.

Finally, we suggest the black box warning must have a barcode or logo on the outer pack of the drug (Figure 1), if it has a black box warning, as this will give an alert for serious side effects or interactions for patient safety, and give an alert for physicians, patients, and pharmacists. Also, we suggest the warning black box drugs must be registered as notes in prescriptions either written or electronic prescriptions, and in medical records at hospitals and pharmacies and in electronic patient files, as this enhances health outcomes and avoids serious side effects for patient safety. Also, recent technology like artificial intelligence Advancements in technology provides an opportunity to bridge the knowledge gap effectively. The utilization of electronic health records (EHRs) to incorporate black box warnings directly into clinical decision support systems can use recent technology like artificial intelligence. By integrating these warnings into healthcare providers' workflow, the likelihood of overlooking or dismissing them decreases significantly. Additionally, leveraging artificial intelligence (AI) and machine learning can help analyze large-scale adverse event data and identify potential risks associated with medications, further enhancing awareness and prevention.

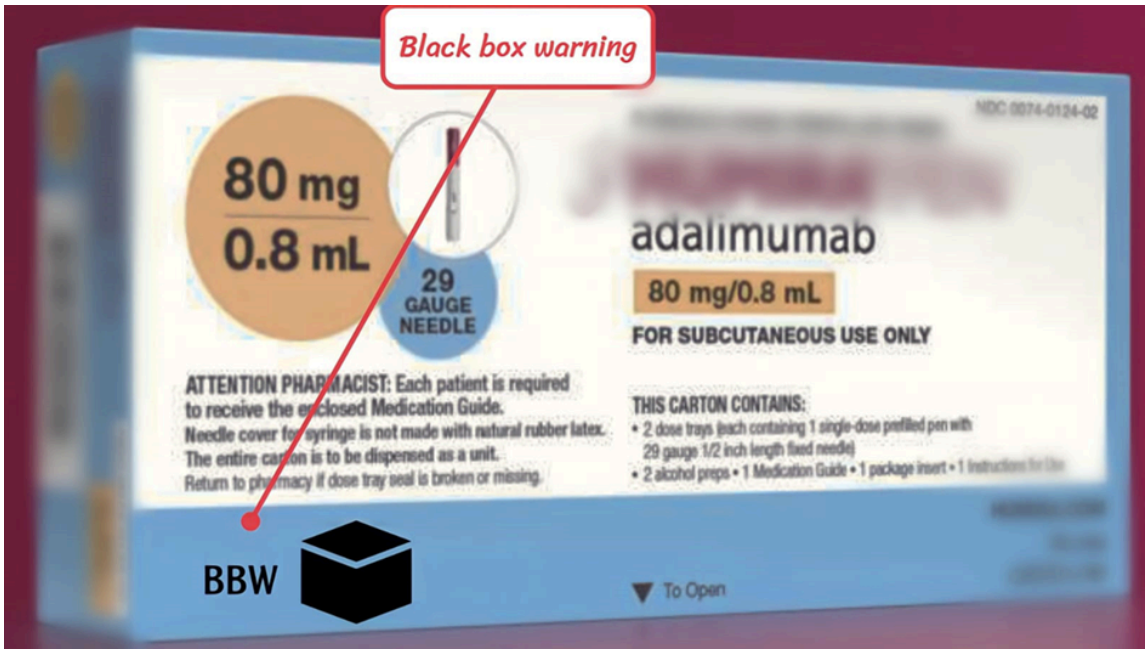

Figure 1. This example of the logo of the black box was created by us to put on the front of drug packs like adalimumab, as this drug has a black box warning.

Healthcare professionals must stay updated on the latest evidence, guidelines, and recommendations related to medications with black box warnings. Collaboration with clinical pharmacists, therapeutic committees, and other experts can enhance the implementation of preventive measures and improve patient safety.

Black box warnings, also known as boxed warnings, are the most serious type of warning issued by regulatory authorities, including the U.S. Food and Drug Administration (FDA), regarding the potential risks associated with a particular medication. Despite their critical importance, the knowledge gap surrounding black box warnings remains a significant concern, leading to inadequate awareness and prevention of potential adverse events. This paper proposes a novel approach to address this issue by leveraging technology, education, and collaboration to enhance awareness and promote proactive prevention strategies.

Conclusion

From previous cross-sectional studies, knowledge deficits remain. Closing the knowledge gap surrounding black box warnings is of paramount importance to enhance awareness and prevent

medication-related adverse events. We suggest a barcode or logo on the outer pack of the drug (Figure 1) if it has a black box warning, also registered in electronic prescriptions as a black box with a warning alarm in front of the drug carry black box warning as this will give an alert for serious side effects or interactions for patient safety and give an alert for physicians, patients, and pharmacists, also effectively addressing this issue. All stakeholders need to work together to ensure that black box warnings are understood, respected, and acted upon, ultimately improving patient safety and outcomes.

Warning

Since the idea is novel and we are the owner of this idea we control it and we do not allow anyone or an institution to use or take it without our consent as this is our concept and we published it for the first time on the Qeios platform.

References

1. ^*Warnings and precautions, contraindications, and boxed warning sections of labeling for human prescription drug and biological products [Internet]. 2011 [cited Sept. 2015] Available from: http://www.fda.gov/Drugs/GuidanceComplianceRegulatoryInformation/Guidances/ucm065010.htm.*
2. ^*Fornaro M, Anastasia A, Valchera A, Carano A, Orsolini L, Vellante F, Rapini G, Olivieri L, Di Natale S, Perna G, Martinotti G, Di Giannantonio M, De Berardis D. The FDA "Black Box" Warning on Antidepressant Suicide Risk in Young Adults: More Harm Than Benefits? Front Psychiatry. 2019 May 3; 10:294. doi: 10.3389/fpsyt.2019.00294.*
3. ^*Hagan JB, Ender E, Divekar RD, Pongdee T, Rank MA. Risk for Postmarket Black Box Warnings in FDA-Approved Monoclonal Antibodies. Mayo Clin Proc Innov Qual Outcomes. 2021 Dec 28;6(1):69-76. doi: 10.1016/j.mayocpiqo.2021.11.009. PMID: 35024565; PMCID: PMC8724853.*
4. ^*Smollin CG, Fu J, Levin R. Recognition and Knowledge of Medications with Black Box Warnings Among Pediatricians and Emergency Physicians. J Med Toxicol. 2016 Jun;12(2):180-4. doi: 10.1007/s13181-015-0519-3.*
5. ^*Dorsey ER, Rabbani A, Gallagher SA, Conti RM, Alexander GC. Impact of FDA black box advisory on antipsychotic medication use. Arch Intern Med. 2010 Jan 11;170(1):96-103. doi: 10.1001/archinternmed.2009.456. PMID: 20065205; PMCID: PMC4598075.*

6. ^ *https://medlineplus.gov/druginfo/meds/a697048.html*

Declarations

Funding: No specific funding was received for this work.

Potential competing interests: No potential competing interests to declare.