

Access to graphical abstracts via Google Images search: a pathway to connect patients with research?

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Background and objectives

- Upon receiving a diagnosis or prescription for the first time, many patients turn to the internet for information on their condition or treatment
 - 42% of patients research their condition/treatment after visits with their doctors^{1,2}
 - Not all available information online is based on medical research, and many sites may not be credible enough to inform treatment decisions^{3,4}
- Publication extenders, including graphical abstracts, are now strongly recommended in the updated Good Publication Practice (GPP) guidelines⁵ and are becoming more frequently used by medical journals to increase the reach of their research⁶
- Given the importance of clinical data accessibility to patients/caregivers, we investigated how often Google Images searches would lead to graphical abstracts and to linked open access (freely accessible) journal articles

Research design and methods

- We selected 2 prevalent diseases – type 2 diabetes and multiple sclerosis – and 2 commonly prescribed treatments for each disease⁷⁻¹⁰
- We conducted a Google Images search in December 2022 to look for graphical abstracts using the following terms:
 - Type 2 diabetes
 - Type 2 diabetes metformin
 - Type 2 diabetes glipizide
 - Multiple sclerosis
 - MS
 - Multiple sclerosis interferon
 - Multiple sclerosis fingolimod
 - MS interferon
 - MS fingolimod
- The first 50 results for each search string were catalogued, resulting in 450 images that were further categorized by type of image and hosting source as illustrated in **Table 1**, **Table 2**, and **Figure 1**

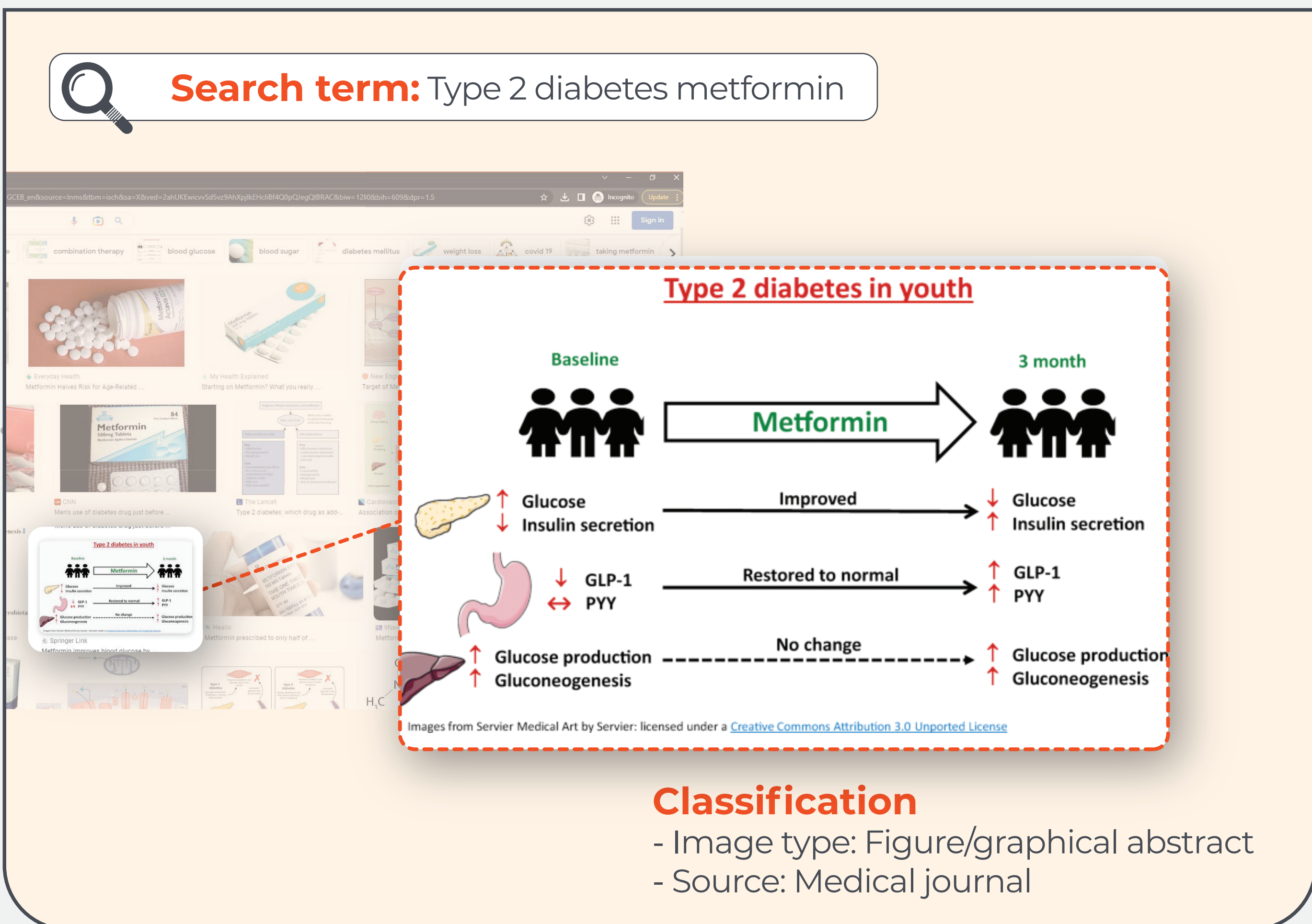
Table 1: Examples of types of images found

Image Type	Description	Sample
Figure	Graphic containing scientific information, whether an infographic, graphical abstract, data figure, etc	
Image of packaging	Image of pharmaceutical product/packaging	
Image of people	Images of individuals, including stock photos, with no additional text or information	
Other	Images that did not fall into categories above, including book and journal covers, video screenshots, word art, etc	

Table 2: Classifications of sources of images found

Type	Example(s)
Academic centers	University of Arizona
Association or society	MSAA (Multiple Sclerosis Association of America)
Blog post	Diabetes Strong
Government	CDC, NIH
Health website	Healthline, MedicineNet
Health website (hospital/clinic)	Cleveland Clinic, Mayo Clinic
Medical journal	BMJ, CNS Drugs
News	CNN, Medscape
Patient advocacy group	CreakyJoints
Wikipedia	
YouTube	
Other	Twitter, corporate pharma sites

Figure 1: Sample classification of search result images



Results

- Of the 450 Google Images results, **80% were figures** (n=360); **9% were images of packaging** (n=40); **2% were images of people** (n=11); and **9% were “other”** (n=39)
- 37% of all our catalogued Google Images results** (n=165) **were posted by medical journals**
 - These images led to **110 unique articles**
 - 63% of the articles were open access** (n=69/110)
 - Only 3% of all Google Images results were categorized as graphical abstracts** (n=14/450)
- 160/165 figures (97%)** that led to medical journals were from searches that included a drug name
- Other images led to general healthcare websites (15%), news outlets (12%), health websites (hospital/clinic) (7%), associations or societies (4%), academic centers (4%), government websites (3%), patient advocacy groups (2%), Wikipedia (2%), independent blogs (2%), YouTube (1%), or other sites (12%)

Discussion

- Fewer graphical abstracts appeared in our search results than anticipated (3% of all results). Potential reasons could be due to:
 - Specific diseases searched (prevalent chronic disease conditions and their established treatments) versus searching for a rare disease or a condition with newer treatments
 - Low uptake of such pub extenders
 - Search engine algorithms
- However, with 37% of the figures from our search results leading to journal articles, and 63% of the articles being open access, we found that many images besides graphical abstracts can lead the searcher to vetted, peer-reviewed (often free) medical information
- These findings demonstrate that **credible information is available through a simple Google Images search that includes the condition and drug name**, at least for the diseases and treatments researched here

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Disclosures

- This study was supported by InCight. All authors are employees of InCight.

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