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Research Article

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# METEMPSYCHOSIS OF PIOGLITAZONE: THE SAY OF THE WORLD WIDE WEB

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# ABSTRACT

Aims and Objectives: Pioglitazone, a member of thiazolidiones, is commonly used to treat diabetes mellitus. However, recently there has been a lot of debate regarding its use because of its withdrawal from the Indian market fearing risk of bladder cancer and subsequent reintroduction. Since internet remains an easily accessible tool for millions, this study was performed to assess the quality and reliability of such articles on the internet. Materials and Methods: This study  $24^{\text{th}}$ September 2013. The keyword performed on was "PIOGLITAZONE" was used in search engines GOOGLE, YAHOO, ASK and BING. Top 10 websites of search results from each search engine were browsed. A total of 40 web sited taken for review. The quality of information related to PIOGLITAZONE published was

Assessed using a quality criteria questionnaire tool for health information, designed by the university of Oxford, called DISCERN. The overall quality of each website is rated as low, moderate and high. **Results:** Of the total 40 websites taken for analysis, 75% (n = 30) were of moderate quality and 7.5% (n = 3) of high quality. About 17.5% (n = 7) of the websites display poor quality information about PIOGLITAZONE. **Conclusion:** Though there are innumerable websites available which display huge amount of information on PIOGLITAZONE, the overall quality of this information is moderate. Hence internet search engines can only be used as a valuable adjunct but can never replace the expert opinion of a physician.

KEYWORDS: Pioglitazone, diabetes, bladder cancer, online literature.

#### **INTRODUCTION**

Pioglitazone is a ligand and agonist of both PPARα and PPARγ (peroxisome proliferator activated receptor), which improves insulin sensitivity by inducing adipose tissue differentiation and apoptosis.<sup>[1]</sup> The major adverse effects seen with Pioglitazone include weight gain, edema, macular edema, congestive cardiac failure, osteoporosis and increased risk of bone fractures and hepatic dysfunction.<sup>[2]</sup> The association between bladder cancer and Pioglitazone therapy, was demonstrated in PROACTIVE study, consequently the Food and Drug Administration (FDA) issued a warning in 2011 stating that the risk of bladder cancer should be included in its package insert. The drug was banned in India in 2013 and was subsequently re-introduced into the market. Hence a large number of people accessed the World Wide Web, to seek out the facts and truth regarding the same. However, the reliability and quality of such enormous information still remains a question. Hence this study was conducted to assess the quality and reliability of information related to PIOGLITAZONE on the World Wide Web.

#### **MATERIALS AND METHODS**

The study was conducted at the Institute of Pharmacology, Madurai Medical College, Madurai.It was a single center, open label, prospective, observational, clinical study, conducted on 24<sup>th</sup> September 2013.The keyword "PIOGLITAZONE" was used in search engines GOOGLE, YAHOO, ASK and BING. Top 10 websites of search results from each search engine were browsed. Online literature published before the date on which the study was conducted. A total of 40 websites taken for review (Figure 1, 2, 3, 4).

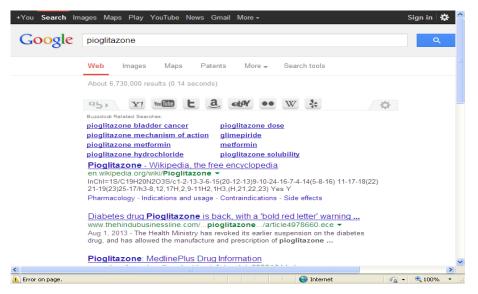
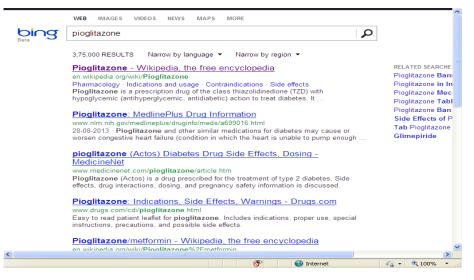


Figure 1: Screenshot from Google

Maria										
YAHOO	piogli	pioglitazone								
	WEB	IMAGES	VIDEO	NEWS	ANSWERS	OMG!				
	Searc	h: 💿 the W	eb 🔘 pag	es from Ind	a					
ELATED SEARCHES	Also t	ry: <u>piogl</u> i	itazone h	ydrochloi	ide					
voglitazone vydrochloride					encycloped		<i></i>			
ILTER BY TIME		Pharmacology   Indications and usage   Contraindications   Side effects Pioglitazone is a prescription drug of the class thiazolidinedione (TZD) with								
nytime		hypoglycemic (antihyperglycemic, antidiabetic) action to treat diabetes. It en.wikipedia.org/wiki/Pioglitazone - <u>Cached</u> More results from en wikipedia org a <b>Pioglitazone</b> : MedlinePlus Drug Information								
ast day										
astweek	Dianti									
Past month	Proglitazone and other similar medications for diabetes may cause or worsen congestive heart failure (condition in which the heart is unable to pump enough www.nlm.nih.gov/medineplus/dugnfo/meds/a699016.html - <u>Cached</u> <u>More results from nlm nih gov »</u>									
	pioglitazone (Actos) Diabetes Drug Side Effects, Dosing Pioglitazone (Actos) is a drug prescribed for the treatment of type 2 diabetes. Side effects, drug interactions, dosing, and pregnancy safety information is discussed. www.medicinenet.com/pioglitazone/article.htm - Cached More results from medicinenet com a									
					fects, Warnii					





**Figure 3:- Screenshot from Bing** 

Ask	pioglitazone	Fir
verything⊧	95) Y! HE & en * •• W *	Popular Q&A Q: What is piogl A: Pioglitazone is
nages	Explore Answers About	thiazolidinedio
ews	Pioglitazone for Type II Diabetes Pioglitazone Oral Dosage	(antihyperg Source: www
deo	Medicine Actos Have Side Effects	Q: What is piog
A	Side Effects of Actos Symptoms While Taking Actos	A: Generic name medication. S http://www.act
ference	Actos Lawsuits	Source: ans
ps	Differences between Pioglitazone Rosiglitazone Pioglitazone HCL	Q: What is piog A: Pioglitazone o
opping	Actos <b>Pioglitazone</b> Precautions Januvia	people with ty Read More »
re 💌	Actos Class Action Actos	Source: www
	More Answers	
	Pioglitazone (oral) PIOGLITAZONE helps to treat type 2 diabetes. It helps to control blood suga Treatment is combined with diet and exercise. This medicine may be used fo other purposes; ask your health care provider or pharmacist if you have More	

Figure 4:- Screenshot from ask.com

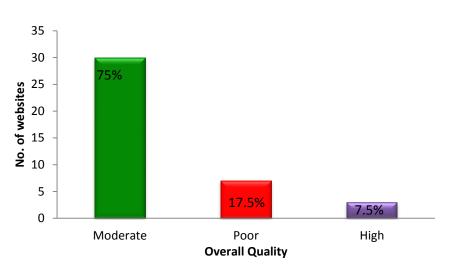
The quality of information related to PIOGLITAZONE published was assessed using a quality criteria questionnaire tool for health information, designed by the university of Oxford, called DISCERN (Table 1). The overall quality of each website is rated as low, moderate and high.

#### TABLE 1

S. No	QUESTIONS		NO	PAF	RTIALLY	YES
1.	Are the aims clear?	1	2	3	4	5
2.	Does it achieve its aims?	1	2	3	4	5
3.	Is it relevant?	1	2	3	4	5
4.	Is it clear what sources of information were used to compile the publication	1	2	3	4	5
5.	Is it clear when the information used or reported in the publication was produced?	1	2	3	4	5
6.	Is it balanced and unbiased?	1	2	3	4	5
7.	Does it provide details of additional sources of support and information?	1	2	3	4	5
8.	Does it refer to areas of uncertainty?	1	2	3	4	5
9.	Does it describe how each treatment works?	1	2	3	4	5
10.	Does it describe the benefits of each treatment?	1	2	3	4	5
11.	Does it describe the risks of each treatment?	1	2	3	4	5
12.	Does it describe what would happen if no treatment is used?	1	2	3	4	5
13.	Does it describe how the treatment choices affect overall quality of life?	1	2	3	4	5
14.	Is it clear that there may be more than one possible treatment choice?	1	2	3	4	5
15.	Does it provide support for shared decision making?	1	2	3	4	5

The "DISCERN" questionairre used by the university of Oxford to assess the quality of consumer healthcare information on the world wide web. Each webpage was assessed using the above 15 questions. The average score was calculated and the quality of health care information on the webpage was graded according to the following score Low (Serious or extensive shortcomings): 1 to 2, Moderate (Potentially important but not serious shortcomings: 3 to 4, High (minimal shortcomings): 5.

**RESULTS:** Of the total 40 websites taken for analysis, 75% (n = 30) were of moderate quality and 17.5% (n = 7) of poor quality. About 17.5% (n = 3) of the websites display high quality information about PIOGLITAZONE (Fig. 5).



**Figure 5 : Quality of information about Pioglitazone** 

## DISCUSSION

The preclinical studies conducted on male rats with Pioglitazone showed increased incidence of bladder tumors compared with placebo. In humans the association between bladder cancer and Pioglitazone was first demonstrated in PROactive study, which reported a non significant excess of bladder tumors among patients treated with Pioglitazone (p=0.069). <sup>[3]</sup> It is hypothesized that chronic bladder irritation as a result of crystal formation, rather than PPAR related signaling, is the cause for the observed urolithial carcinogenesis. <sup>[4]</sup>

The FDA recommends against the use of Pioglitazone in patients with active bladder cancer and to use Pioglitazone with caution in patients with a prior history of bladder cancer. However, a cumulative dose of > 28000 mg or an average dose of about 40 mg would cause bladder cancer. In India, the average dose is only about 15 mg hence to achieve a cumulative dose of 28000 mg; it would take about 5 years. <sup>[5]</sup> Since a lifelong treatment is required in diabetes, it would be justified to prescribe Pioglitazone only for short-term treatment.

#### CONCLUSION

There appears to be an increased risk of bladder cancer with Pioglitazone. Since the quality of information available on the web is not too reliable, it would be wise for the common man to value his physician's opinion rather than the online literature regarding Pioglitazone.

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