



YouTube as a source of information in retinopathy of prematurity

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Abstract

Aim We aimed to evaluate the quality of information available on YouTube regarding the basic information, examination, diagnosis, and the treatment of retinopathy of prematurity (ROP).

Methods A YouTube search was performed on <https://www.youtube.com/> for videos pertaining to “retinopathy of prematurity” and “ROP.” The first 100 relevant videos were included in the study. Two ophthalmologist reviewers independently evaluated and classified the videos as useful or misleading. The videos were accepted as “useful,” if they provide scientifically correct information about any aspect of ROP: cause, pathogenesis, symptoms, findings, treatments, procedure details of the treatment, epidemiology, and prognosis. The videos contain scientifically unproven information are defined as “misleading.” Videos were also classified according to the source: surgeon/practitioner, independent user, hospital/free clinic, social media/TV, medical site, university, and advertisement.

Results The mean duration, the mean days on YouTube, the mean comments per videos, and the mean dislikes per video were similar in useful and misleading videos. However, the mean likes per day, mean view per video, and mean view per day were significantly higher in useful videos than those of misleading videos ($p = 0.004$, $p = 0.022$, and $p = 0.011$, respectively). Most of the useful videos were uploaded by healthcare professionals including source from university, hospital/free clinic, and surgeon/practitioner (48/64). The videos uploaded by healthcare professionals were more useful compared to those of non-healthcare professionals ($p = 0.029$).

Conclusion YouTube could be used as an important tool for patient information in ROP. However, one third of the YouTube videos regarding ROP are misleading and may present a risk of harmful consequences. In this aspect, authoritative videos by healthcare professionals should be uploaded for dissemination of reliable information on ROP.

Keywords Patient information · Retinopathy of prematurity · YouTube videos

Introduction

Retinopathy of prematurity (ROP) is one of the most common cause of blindness in children [1]. It must be recognized and treated early to prevent ocular morbidity particularly blindness

[2]. For this aspect, information to the parent takes importance to provide patient compliance to examination schedule and treatment if necessary.

The internet provides a wide range of medical information, but its reliability is difficult to determine. In recent years, with respect to increased use of internet, people access to internet to gain information about the diseases through especially on mobile devices. YouTube is one of the most popular social media in the world and may be used as a source for patient information [3]. Since the video contents on YouTube are not peer-reviewed, the information reliability is unpredictable.

It is important to inform the patients appropriately for treatment compliance. For easier understanding of the parents of the patients with ROP, it may be more memorable to do the visualization with the videos on social media. The present study aimed to evaluate the quality of information available on YouTube regarding the basic information, examination, diagnosis, and the treatment of ROP.

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Material and methods

Since the present study is an observational study as it involved the use of public access data only, there is no need for approval of the ethics committee. Between April 14 and 25, 2018, a YouTube search was performed on <https://www.youtube.com/> for videos pertaining to “retinopathy of prematurity” and “ROP.” These search terms were selected based on an initial exploratory search of the terms related to ROP that produced the most relevant results. All videos for the key words were screened and the first 200 videos for each key word were analyzed. The first ten pages were searched, since they are the most accessible and easiest to find, and 95% of the internet users do not view the pages further than ten [4]. The first 100 relevant videos were included in the study. If the content of the videos were not in English, they were excluded.

Two ophthalmologist reviewers independently evaluated and classified the videos as useful or misleading. The videos were accepted as “useful,” if they provide scientifically correct information about any aspect of ROP: cause, pathogenesis, symptoms, findings, treatments, procedure details of the treatment, epidemiology, and prognosis. If the videos lack these information and contain scientifically unproven information, they were labeled as “misleading.” Moreover, personal videos that contain personal experience about ROP that do not provide the abovementioned properties of ROP were also defined as misleading. Any duplicating videos were excluded from the study. The videos uploaded before 01 January 2018 were included in the study to give more time to evaluate the data, such as view, like, and dislike counts.

The source of the videos, date of upload, the number of views, number of likes and dislikes, and the number of comments of the videos were recorded. When likes, dislikes, or comments were disabled on the video by the uploader, they were excluded from analysis. Using this information, the days from upload, views per day, and likes/dislikes ratio were calculated. Videos were also classified according to the source: surgeon/practitioner, independent user, hospital/free clinic, social media/TV, medical site, university, and advertisement. The content of the videos including real procedure, physician explanation, and animation, were also noted.

Statistical analysis

The kappa coefficient was used to evaluate the agreement between two independent reviewers. The numerical scores of the videos obtained from the reviewers were averaged. Statistical analysis was performed using SPSS Version 18 (SPSS Inc., Chicago, IL). Normal distributions of continuous variables were measured by the Kolmogorov-Smirnov test. The Mann Whitney *U* test was used for a comparison of continuous variables since they did not show normal distribution. Categorical variables were compared using a chi-square test.

Table 1 The comparison of YouTube parameters with respect to usefulness

	Useful	Misleading	<i>p</i> value
Number of videos (%)	64	36	NA
Mean duration (sec) per video	431	328	0.404
Mean likes ($\times 10^{-3}$) (per day)	14	6	0.004
Mean dislikes ($\times 10^{-3}$) (per day)	1.3	0.5	0.238
Mean view per video	12,103	3265	0.022
Mean view (per day)	5.23	1.61	0.011
Mean comment per video ($\times 10^{-3}$)	2.1	2.4	0.182
Mean days on YouTube	1612	1545	0.308
Like/dislike ratio	14.18	5.65	0.040
Total duration (sec)	27,597	11,514	NA
Total days on YouTube	103,211	55,645	NA
Total views	774,608	117,574	NA
Total like	1174	196	NA
Total dislike	176	27	NA
Total comments	222	75	NA

A *p* value less than 0.05 was accepted as statistically significant.

Results

The present study showed that the mean duration, the mean days on YouTube, the mean comments per videos, and the mean dislikes per video were similar in useful and misleading videos (Table 1). However, the mean likes per day and the mean views per day for the useful videos were significantly higher than those of misleading videos ($p = 0.004$ and $p = 0.011$, respectively). The mean view of the useful videos were also found significantly higher compared with those of the misleading videos (12103 vs 3265, $p = 0.022$).

Most of the useful videos were uploaded by healthcare professionals including source from university, hospital/free

Table 2 Categorization of the useful the videos according to uploader, *n* (%)

	Total video	Useful (%)	Misleading (%)
University	4	3 (75)	1 (25)
Hospital/free clinic	25	20 (80)	5 (20)
Surgeon/practitioner	31	25 (81)	6 (19)
Independent user	21	6 (29)	15 (71)
Social media/TV	5	4 (80)	1 (20)
Medical site	7	4 (57)	3 (43)
Advertisement	7	2 (29)	5 (71)

Table 3 The analysis of the useful videos according to uploader

Videos	University	Hospital/free clinic	Surgeon/practitioner	Independent user	Social media/TV	Medical site	Advertisement
Useful videos	3	20	25	6	4	4	3
Mean duration (sec)	166	351	506	405	943	207	190
The mean days on YouTube	1501	1588	1608	2276	1349	1467	899
Mean likes ($\times 10^{-3}$) (per day)	2.67	26.42	9.21	58.67	3.25	11.50	16.00
Mean views per video	1419	9067	2729	80,761	322	6797	3863
Mean dislikes ($\times 10^{-3}$) (per day)	1	2.42	0.42	16.67	0.00	4.25	0.00
Mean views per video per day	1.00	5.69	1.71	24.14	1.13	4.21	4.4
Like per video	1.8	23.2	7.8	21.5	16.2	11.2	18.4
Dislike per video	0.7	1.5	0.3	5.1	0	3.7	0
Comment per video	0.8	1.5	2.3	7.2	0	0.5	1.1
Like/dislike ratio	2.0	18.6	11.4	6.15	NA	5.45	NA

clinic, and surgeon/practitioner (48/64). The videos uploaded by healthcare professionals have higher usefulness compared to those of non-healthcare professionals (80% vs 40%, $p = 0.029$) (Table 2).

The analysis of the useful videos according to uploader and the content were given in Tables 3 and 4. The real procedures were commonly uploaded by surgeon/practitioner users. Their videos also include information about the treatment of ROP. Videos from hospitals/free clinics mainly provide basic information about ROP (Table 4).

A representative link was given for misleading video as <https://www.youtube.com/watch?v=Rf0HTDiYXkM>. In this video, the parents of a patient with ROP are talking about what they feel about their child’s disease. However, no relevant information was given about the abovementioned aspects of ROP.

A significant degree of achievement was found between reviewers evaluating the videos in terms of their usefulness. The inter-reviewer reliability was found 95.7% (kappa score 0.957).

Discussion

YouTube is the one of the most visited websites on the internet [5]. It has become a major source of visual information for medical students, residents, and even patients [6, 7]. Any registered user has the opportunity to upload videos on YouTube™ without confirmation or standardization the accuracy of the content of health-related topics. Hence, some of the videos might be irrelevant with the searched topic. The present exploratory study illustrated that ROP videos are available on YouTube. The findings of the present study highlighted that a different variety of uploaders use YouTube in the topics of ROP and retinopathy of prematurity. Of the videos included in this study, 64% were considered as “useful.”

The present study showed that the videos posted by healthcare providers are highly useful than those of non-healthcare professional users. The most frequent uploaders are practitioner and surgeons. The second frequent video uploaders are the hospitals and free clinics. Interestingly,

Table 4 The analysis of the useful videos according to content

Video content	University	Hospital/free clinic	Surgeon/practitioner	Independent user	Social media/TV	Medical site	Advertisement
Useful videos	3	20	25	6	4	4	2
Basic information	1	17	12	4	1	1	1
Examination	1	12	11	4	1	2	1
Treatment	3	13	19	2	2	2	0
Treatment options	0	11	7	1	1	2	0
Stages/zones/plus disease	1	8	10	4	0	1	0
Animation	0	6	3	2	0	3	1
Real procedure	1	7	14	2	1	0	1

universities uploaded very small number of videos on YouTube. On the other hand, the usefulness of videos uploaded by independent users was too low compared to those of healthcare professional uploaders. The videos posted from medical sites or the advertisement videos also have lower usefulness rate. TV shows have higher usefulness (80%), but it may be due to lower number of uploaded videos on YouTube.

When the useful videos were analyzed, most of the videos were uploaded by surgeons/practitioners and hospitals/free clinics (45/64, 70% of useful videos). The surgeons/practitioners tend to upload videos that include information about treatment and real procedure. Besides, the hospitals and free clinics are mainly uploaded the videos that include basic information about ROP.

The view count is one of the parameter that shows the popularity of the videos on YouTube [8]. However, the number of views can be manipulated by any user, or by directed links to the YouTube videos. Hence, the view count as well as the like or dislike counts should be considered with respect to these affects. In the present study, the “useful” videos seemed to have more views and likes. We may suggest that the videos uploaded by healthcare professionals increase the like and view counts of the videos.

One of the important aspects of using social media including YouTube for ROP information is the ability to help parents of the infants with ROP who would otherwise be hard to reach and engage. On the other hand, the largely unregulated videos on YouTube may lead to inaccurate or misleading health information that was not peer-reviewed by healthcare professionals. Therefore, the parents of the infants with ROP who may search for patient information on YouTube should be cautioned to interpret the videos with extreme attention.

Previous studies reported YouTube as an education resource in ocular disorders [9–11]. Guthrie et al. [11] examined the YouTube videos about retinitis pigmentosa and reported that half of the videos were misleading. Bae and Baxter [10] reported that most of the cataract surgery videos on YouTube are not adequately educational even if they were uploaded by healthcare professionals.

There are some limitations in the present study. First, the evaluation of the videos was subjective. However, the agreement between two independent reviewers was fairly high. The current study investigated only the videos in English language. Although it is hard to generalize the results of the present study, English is accepted as the prevailing language among internet users. This study presents information available on YouTube at a single time point. Hence, the content of YouTube may be changed over time. Besides, it is not clear who uploaded and who viewed and commented on the videos included in the present study.

In conclusion, YouTube could be used as an important tool for patient information in ROP. One third of the YouTube videos regarding ROP are misleading and may present a risk of harmful consequences. Authoritative videos posted by trusted sources should be used to prevent against videos with a content of misleading information. Hospitals, universities, and surgeons/practitioners appeared to be the most credible sources of information about ROP. The ophthalmologists can direct patients to appropriate video sources, to obtain accurate information about ROP.

Compliance with ethical standards

Ethical approval Since the present study is an observational study as it involved the use of public access data only, there is no need for approval of the ethics committee.

Conflict of interest The authors declare that they have no conflict of interest.

Informed consent Since the present study is an observational study as it involved the use of public access data only, there is no need for informed consent.

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