

YouTube as a source of information on rhinosinusitis: the good, the bad and the ugly

T C BIGGS¹, J H BIRD², P G HARRIES¹, R J SALIB¹

¹ENT Department, University Hospital Southampton NHS Foundation Trust, and ²ENT Department, Portsmouth Hospital NHS Foundation Trust, UK

Abstract

Objective: YouTube is an internet-based repository of user-generated content. This study aimed to determine whether YouTube represented a valid and reliable patient information resource for the lay person on the topic of rhinosinusitis.

Methods: The study included the first 100 YouTube videos found using the search term ‘sinusitis’. Videos were graded on their ability to inform the lay person on the subject of rhinosinusitis.

Results: Forty-five per cent of the videos were deemed to provide some useful information. Fifty-five per cent of the videos contained little or no useful facts, 27 per cent of which contained potentially misleading or even dangerous information. Videos uploaded by medical professionals or those from health information websites contained more useful information than those uploaded by independent users.

Conclusion: YouTube appears to be an unreliable resource for accurate and up to date medical information relating to rhinosinusitis. However, it may provide some useful information if mechanisms existed to direct lay people to verifiable and credible sources.

Key words: Consumer Health Information; Internet; Sinusitis; Rhinitis

Introduction

Rhinosinusitis is a common health problem that is associated with a significant financial burden for the National Health Service. It is defined as an inflammation process within the mucosa of the nose and paranasal sinuses. Rhinosinusitis is characterised by two or more symptoms; one of which must be nasal obstruction or discharge (anterior or posterior nasal drip), with the others being facial pain or loss of smell.¹ Rhinosinusitis is one of the most common disorders encountered by general practitioners and otorhinolaryngologists, with the chronic form of the disease affecting between 5 and 15 per cent of the population.¹ The prevalence of sinusitis (146 per 1000 individuals) has been reported to exceed that of any other chronic condition.¹ Quality of life scores for chronic rhinosinusitis patients are reported to be lower than the scores for those suffering from chronic obstructive pulmonary disease, congestive heart failure, back pain or even angina.²

Traditionally, patients received health information and advice via their general practitioner. However, with the development of the internet over recent decades, this dynamic has changed. It has been reported that a third of patients use the internet as a

source of medical information,³ with 11 per cent of patients researching their symptoms prior to an outpatient appointment.⁴

Video provides an excellent medium for medical education, both for clinicians and for the public. The website YouTube (Google, Mountain View, California, USA), which was launched in June 2005 as an internet-based repository of user-generated content,⁵ has emerged as one of the largest sources of freely accessible content. In addition to home videos, music and television clips, YouTube is increasingly being used as a source of educational material, and now includes videos from prestigious academic institutions such as Cambridge and Stanford universities, as well as numerous uploads from individual medical professionals and health information websites (e.g. www.patient.co.uk).⁶ However, as with many internet sites, the content on YouTube is not peer reviewed, it has no source citations, and it is often difficult to verify the source or credibility of the material posted on the site. This can lead to potentially misleading or frankly dangerous advice.^{7,8}

YouTube has been evaluated as a source of information on various topics, including prostate cancer,⁹ flu pandemics¹⁰ and human papillomavirus

immunisation.¹¹ However, within the literature, there have been no such studies in relation to otorhinolaryngological conditions. The current study was conducted to evaluate and analyse the quality of rhinosinusitis videos, with the aim of deciding whether YouTube represented a valuable tool in patient education within this area.

Materials and methods

The aims of this study were threefold. Firstly, we attempted to ascertain the general nature of videos uploaded onto YouTube on the topic of rhinosinusitis with analysis of the information made available for patients. Secondly, we aimed to grade the videos in an attempt to evaluate the quality of the available content. Thirdly, we sought to make a recommendation as to the overall value of YouTube as a resource for patient education in relation to rhinosinusitis.

The YouTube website (www.youtube.com) was searched for the term 'sinusitis' on 17 and 18 August 2012, with the first 100 videos selected for inclusion into the study. All videos uploaded since the start of YouTube (2005) were eligible for inclusion. Non-English language videos were excluded.

All videos were viewed by the first author (TCB), who assessed their content and documented the following parameters: length of video; number of views; number of likes or dislikes (an indication of whether users prefer certain videos); uploaded source (independent user, medical professional, health information website, news site or drug company); symptoms described; and the various management options mentioned, including medical and surgical, as well as other complementary forms of treatment with no clear evidence base (e.g. acupuncture, massage, vitamin supplementation and herbal remedies). The content of the videos was also graded according to the ability of the videos to inform the lay person on the general topic, symptoms and management options of rhinosinusitis. The videos were categorised as: 'useful', 'not useful', 'slightly misleading', 'completely misleading' or 'useful but only for medical personnel'. A list of the top 10 videos was compiled based on those videos that scored the highest for the number of mentions of both key symptoms, and European position paper on rhinosinusitis and nasal polyps management guidelines (2012).¹

To ensure quality control, the second author (JHB) separately assessed the videos for all the parameters listed, and provided an overall grade based on the ability of the videos to inform the lay person about rhinosinusitis. The two classifications of video results were compared, revealing an inter-observer correlation rate of over 95 per cent. Where parameter grading differed significantly, discussion was undertaken to decide on a mutually agreed outcome.

Data were collated and analysed using Microsoft Excel (2009) (Redmond, Washington, USA). Statistical analyses were performed with the Statistical Package

for the Social Sciences (version 20) software (IBM, Armonk, New York, USA), using the chi-square and Mann–Whitney U tests (statistical significance was defined as $p < 0.05$).

Results

The study included 100 videos, comprising a total of 9 hours and 29 minutes. The majority of the videos were uploaded by individual users (48), with the remainder uploaded by medical professionals (22), and from health information websites (14), news channels (14) and drug companies (2). The total number of views for all videos was 2 281 225, with a mean of 2281 views per video clip. Figure 1 shows the graded content for all videos studied.

The analysis of video demographics, symptoms and management options in relation to content grading is shown in Table I. Videos deemed to be 'useful but only for medical personnel' received the highest mean number of 'likes' from viewers at 45.3. Those deemed to be 'completely misleading' received a mean of 10.6 'likes' and 1.6 'dislikes'. Nasal discharge and nasal obstruction appeared in 28 per cent and 33 per cent of all videos respectively, compared with 90 per cent of the videos deemed to be in the top 10 per cent. 'Completely misleading' videos were statistically more likely to suggest complementary medicines (48 per cent) compared with those that contained 'useful' information (7 per cent, $p < 0.001$). Antibiotics, nasal irrigation, steroids and surgery appeared in 54 per

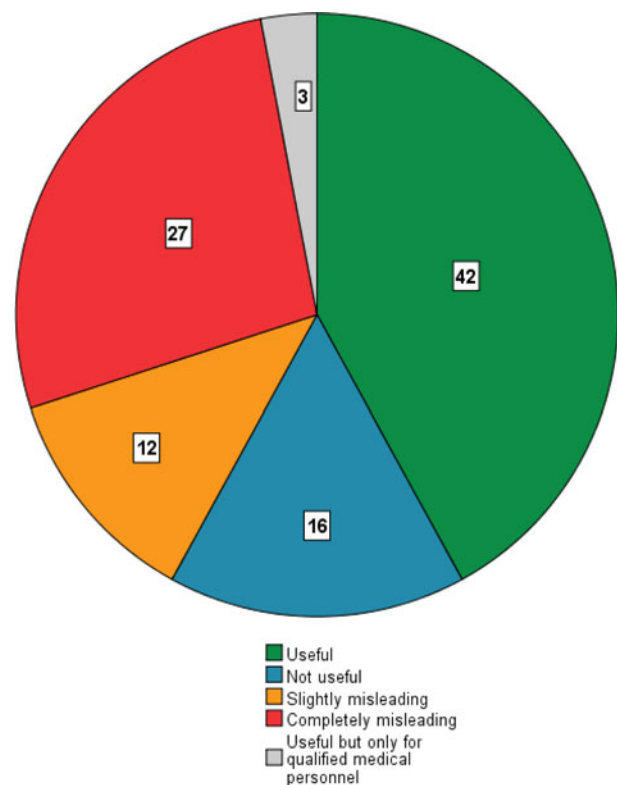


FIG. 1

Grading of content for all videos studied.

TABLE I
ANALYSIS OF VIDEOS IN RELATION TO CONTENT GRADING

Video demographics, symptoms & treatments	Mentioned?	Usefulness of information					Totals	<i>p</i>	Top 10 rated videos
		Useful	Not useful	Misleading, some useful	Completely misleading	Useful only for medical personnel			
Videos (<i>n</i>)		42	16	12	27	3	100	–	10
Total length (hh:mm:ss)		04:48:11	00:45:50	00:48:04	02:05:04	01:08:03	09:29:40	0.307	02:27:59
Mean length (hh:mm:ss)		00:06:51	00:02:31	00:04:00	00:04:37	00:22:41	00:05:41	–	00:14:47
Mean ‘likes’ (<i>n</i>)		14.7	10.6	24.0	10.6	45.3	15.0	0.265	6.6
Mean ‘dislikes’ (<i>n</i>)		1.4	1.1	3.9	1.6	3.3	1.8	0.003	0.4
Mean views (<i>n</i>)		27 210	9670	55 303	8091	33 849	2281	–	3630
Total views (<i>n</i>)		1 142 843	154 732	663 637	218 466	101 547	2 281 225	0.434	34 630
Symptoms									
– Nasal discharge (<i>n</i> (%))	Y	21 (50)	1 (6)	3 (25)	2 (7)	1 (33)	28	0.001	9
	N	21 (50)	15 (94)	9 (75)	25 (93)	2 (67)	72		1
– Nasal obstruction (<i>n</i> (%))	Y	22 (52)	0 (0)	5 (42)	5 (19)	1 (33)	33	0.001	9
	N	20 (48)	16 (100)	7 (58)	22 (81)	2 (67)	67		1
– Change in smell (<i>n</i> (%))	Y	7 (17)	0 (0)	2 (17)	1 (4)	1 (33)	11	0.150	5
	N	35 (83)	16 (100)	10 (83)	26 (96)	2 (67)	89		5
– Facial pain (<i>n</i> (%))	Y	19 (45)	0 (0)	5 (42)	3 (11)	2 (67)	29	0.001	8
	N	23 (55)	16 (100)	7 (58)	24 (89)	1 (33)	71		2
Treatments									
– Antibiotic use (<i>n</i> (%))	Y	21 (50)	1 (6)	3 (25)	4 (15)	1 (33)	30	0.004	8
	N	21 (50)	15 (94)	9 (75)	23 (85)	2 (67)	70		2
– Sinus irrigation (<i>n</i> (%))	Y	22 (52)	0 (0)	2 (17)	1 (4)	1 (33)	26	<0.001	10
	N	20 (48)	16 (100)	10 (83)	26 (96)	2 (67)	74		0
– Steroid use (<i>n</i> (%))	Y	21 (50)	0 (0)	1 (8)	1 (4)	1 (33)	24	<0.001	10
	N	21 (50)	16 (100)	11 (92)	26 (96)	2 (67)	76		0
– Surgery (<i>n</i> (%))	Y	27 (64)	2 (13)	9 (75)	0 (0)	2 (67)	40	<0.001	10
	N	15 (36)	14 (87)	3 (25)	27 (100)	1 (33)	60		0
– Complementary therapy (<i>n</i> (%))	Y	3 (7)	1 (6)	2 (17)	13 (48)	0 (0)	19	<0.001	0
	N	39 (93)	15 (94)	10 (83)	14 (52)	3 (100)	81		10

Y = yes; N = no

TABLE II
ANALYSIS OF VIDEOS IN RELATION TO UPLOAD SOURCE

Video demographics, symptoms & treatments	Mentioned?	Upload source					Totals	<i>p</i>
		Independent user	Medical professional	Health website	News site	Drug company		
Videos (<i>n</i>)		48	22	14	14	2	100	–
Total length (hh:mm:ss)		03:37:25	04:13:23	00:52:23	00:48:42	00:08:06	09:29:40	0.307
Mean length (hh:mm:ss)		00:04:22	00:11:31	00:03:44	00:03:28	00:02:48	00:05:41	–
Mean ‘likes’ (<i>n</i>)		17.0	24.2	6.6	4.1	0.5	15.0	0.265
Mean ‘dislikes’ (<i>n</i>)		2.5	2.1	0.4	0.43	0	1.8	0.003
Mean views (<i>n</i>)		32 536	20 644	12 651	6187	777	2281	–
Total views (<i>n</i>)		1 555 893	454 180	177 121	86 629	7402	2 281 225	0.434
Symptoms								
– Nasal discharge (<i>n</i> (%))	Y	6 (13)	12 (55)	7 (50)	3 (21)	0 (0)	28	0.001
	N	42 (87)	10 (45)	7 (50)	11 (79)	2 (100)	72	
– Nasal obstruction (<i>n</i> (%))	Y	7 (15)	12 (55)	7 (50)	6 (43)	1 (50)	33	0.005
	N	41 (85)	10 (45)	7 (50)	8 (57)	1 (50)	67	
– Change in smell (<i>n</i> (%))	Y	2 (4)	5 (23)	2 (14)	2 (14)	0 (0)	11	0.204
	N	46 (96)	17 (77)	12 (86)	12 (86)	2 (100)	89	
– Facial pain (<i>n</i> (%))	Y	6 (13)	11 (50)	8 (57)	3 (21)	1 (50)	29	0.002
	N	42 (87)	11 (50)	6 (43)	11 (79)	1 (50)	71	
Treatments								
– Antibiotic use (<i>n</i> (%))	Y	6 (13)	10 (45)	7 (50)	7 (50)	0 (0)	30	0.003
	N	42 (87)	12 (55)	7 (50)	7 (50)	2 (100)	70	
– Sinus irrigation (<i>n</i> (%))	Y	5 (10)	11 (50)	6 (43)	3 (21)	1 (50)	26	0.004
	N	43 (90)	11 (50)	8 (57)	11 (79)	1 (50)	74	
– Steroid use (<i>n</i> (%))	Y	2 (4)	11 (50)	5 (36)	6 (43)	0 (0)	24	<0.001
	N	46 (96)	11 (50)	9 (64)	8 (57)	2 (100)	76	
– Surgery (<i>n</i> (%))	Y	4 (8)	18 (82)	7 (50)	11 (79)	0 (0)	40	<0.001
	N	44 (92)	4 (18)	7 (50)	3 (21)	2 (100)	60	
– Complementary therapy (<i>n</i> (%))	Y	14 (29)	2 (9)	2 (14)	0 (0)	1 (50)	19	0.053
	N	34 (71)	20 (91)	12 (86)	14 (100)	1 (50)	81	

Y = yes; N = no

cent of 'useful' videos, compared with 6 per cent of misleading videos ($p < 0.001$); however, these treatments were discussed in 95 per cent of videos judged to be in the top 10 per cent ($p < 0.001$). The top graded videos had a mean number of 3630 views, compared with a mean of 8091 views for 'completely misleading' videos ($p = 0.531$). The top graded videos were also 'liked' less (mean of 6.6) than 'completely misleading' videos (mean of 10.6, $p = 0.491$).

The findings for the analysis of video demographics, symptoms and management options in relation to upload source are shown in Table II. Videos uploaded by independent users mentioned key symptoms (nasal discharge, obstruction, change in smell and facial pain) in 11 per cent of the videos, compared with 43 per cent of those uploaded by medical professionals ($p = 0.01$). Independent users highlighted the European position paper management guidelines in 9 per cent of the videos, compared with 57 per cent of those uploaded by medical professionals ($p < 0.001$). Complementary forms of treatment with no clear evidence base were suggested in 29 per cent of videos uploaded by independent users, compared with 9 per cent of those uploaded by medical professionals ($p = 0.063$).

Discussion

YouTube has a large number of medically orientated videos that are available to anyone with access to the internet. Since the advent of YouTube, over 2 million viewers have accessed the top 100 videos on sinusitis alone. Within this study, 45 per cent of videos were deemed to provide some useful information. However, the remaining 55 per cent contained little or no useful facts, with 27 per cent containing potentially misleading or even dangerous information. A large number of patients are likely to access the internet in search of health-related advice and information, with many likely to use the resources available on YouTube. Within the context of this study, YouTube was found to provide a limited resource on rhinosinusitis education for the lay person: only 10 per cent of the videos on this topic were fit for this purpose. The results presented here suggest that the majority of users seem to access the videos with poorer quality content rather than those graded as more 'useful'.

Patients are more likely now than in the past to access internet-based health resources.^{3,4} However, patients experience difficulty in deciding what information is accurate or reliable within the vast resources provided to them through the internet.¹² Interestingly, within this study, patients seemed to have accessed the top rated videos significantly less than those deemed to contain little or no useful information, or those comprising completely misleading information. The top rated videos were also liked less compared with those deemed to be completely misleading. Despite the lack of appreciation and views from users, the top 10 rated videos highlighted key symptoms and treatments in 50–100 per cent of cases,

compared with only 4–19 per cent of completely misleading videos. This indicates that patients find it difficult to select appropriate videos with quality information. This may be because the higher quality videos were much longer (mean of 14 minutes and 47 seconds) than those that were not so informative (mean of 4 minutes and 37 seconds), potentially putting viewers off.

When examining videos in relation to their upload source (Table II), the majority of poorer videos (i.e. those that do not mention common symptoms and evidence-based treatments for both acute and chronic rhinosinusitis) were uploaded by individual users. Videos deemed to provide more accurate information were uploaded by medical professionals or from health information websites. For example, 90 per cent of the top 10 videos were uploaded by medical professionals or from health information websites, whereas 43 per cent of the content uploaded by individual users was found to be completely misleading. One particularly worrying video, uploaded by an individual user, showed a self-demonstration of how to place a needle through the hard palate, adjacent to an implanted tooth, into the maxillary sinus.¹³ The individual then proceeded to connect the needle to an irrigation device to flush out the sinus. Other videos contained personal accounts of herbal treatments and 'scaremongering' reports on the use of antibiotics. In addition, a number of videos highlighted the use of a technique termed 'craniofacial relief', whereby a balloon is placed into the nasal cavity by a chiropractor and inflated at speed, out-fracturing the inferior turbinate as a result.

A number of studies have examined YouTube as a source of health information for the lay general public, but no such studies have been reported in relation to otorhinolaryngological conditions. There is mixed opinion in the literature on the educational value of YouTube with regard to medical conditions and the ability of YouTube videos to educate patients. Some studies have concluded that YouTube is of real benefit¹⁰ and others have questioned its usefulness.^{9,14–16} A study conducted by Steinberg *et al.* (2010) revealed that the majority of videos (73 per cent) on YouTube relating to prostate cancer were poor in both quality and content, and that YouTube was an inadequate source of prostate cancer information for patients.⁹ In a similar study by Pant *et al.* (2012), which evaluated myocardial infarction information, it was again concluded that only a minority of videos (6 per cent) provided unbiased opinions on all relevant aspects of that disease.¹⁶ However, in a study by Pandey *et al.* (2010), which assessed YouTube as a source of information on the H1N1 influenza pandemic, 71 per cent of videos were found to contain useful information, with 23 per cent providing misleading facts.¹⁰ Our study results lie somewhere between the other studies, with 42 per cent of all videos providing some useful and accurate information

on the topic of rhinosinusitis. However, the majority of videos (55 per cent) were found to contain no useful information or a varying amount of misleading information, suggesting that YouTube is a far from ideal resource for those wishing to learn more about this condition.

- **YouTube is one of the largest sources of freely accessible video content**
- **Over 2 million viewers have accessed the top 100 YouTube videos on sinusitis**
- **Of these videos, 27 per cent contained potentially misleading or dangerous information**
- **YouTube does not appear to constitute a reliable resource for accurate, up to date medical information on rhinosinusitis**
- **The situation could improve if there was a mechanism that directed lay people to verifiable and credible resources**

Nevertheless, YouTube could constitute a very useful resource for information if a mechanism existed whereby lay people were directed to verifiable and credible sources, and by improving the usability of online healthcare information. This could be facilitated through various measures including: emphasising to patients the pitfalls of misleading and potentially dangerous information that is freely available on the internet; providing patients with basic guidelines for content evaluation, with a pre-verified list of reputable sources; improving the awareness of doctors regarding the availability of quality online content in order to better guide patients; encouraging both patients and doctors to highlight inaccurate or misleading videos to YouTube management for removal; and finally, and perhaps most importantly, encouraging doctors to upload their own videos, enabling quality information to be freely available online.

Conclusion

YouTube has emerged as one of the largest sources of freely accessible video content, but as things currently stand, YouTube does not appear to constitute a reliable resource for accurate and up to date medical information relating to rhinosinusitis. Patients should be aware of the source and intent of the material, and be prepared to filter the content accordingly. In particular, patients should be wary of videos uploaded by individual users, as these can include potentially inaccurate or, in extreme cases, dangerous advice. Nevertheless,

YouTube could constitute a very useful resource for information if patients were better educated on the location and availability of quality online content, and if doctors took a more active role in uploading reputable videos and highlighting inappropriate videos for removal.

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Address for correspondence:

Mr T Biggs,
ENT Department,
University Hospital Southampton NHS Foundation Trust,
Tremona Rd, Southampton SO16 6YD, UK

Fax: 0238 0794868

E-mail: tim_biggs@ymail.com

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