The world as it is

Survey of referral patterns and attitudes toward hyperbaric oxygen treatment among Danish oncologists, ear, nose and throat surgeons and oral and maxillofacial surgeons

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Abstract

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In head and neck cancer patients with late radiation injury, hyperbaric oxygen (HBO) is used for therapeutic or prophylactic reasons against soft-tissue and osteoradionecrosis (ORN). Twenty-nine departments of oncology, ENT, oral and maxillofacial (OMF) surgery were surveyed using the Enalyzer tool <www.enalyzer.com>, of whom 21 responded. Data were incomplete in four returns. Within the previous year, 14 departments had referred at least one patient for hyperbaric oxygen therapy (HBOT). There appears to be a generally positive attitude in Danish OMF, ENT and oncology departments towards referral of patients with ORN for HBOT. However, there is an increasing desire for better evidence for its role in head and neck cancer in the prevention and treatment of soft-tissue injury and osteonecrosis following radiotherapy.

Key words

Osteoradionecrosis, bone necrosis, hyperbaric oxygen therapy, radiotherapy, questionnaire, survey

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Introduction

In head and neck cancer patients with late radiation injury, hyperbaric oxygen treatment (HBOT) is used for therapeutic or prophylactic reasons against soft-tissue injury and osteoradionecrosis (ORN). There is some evidence for a clinical effect of HBO on ORN; however, further research within this field is desirable in order to strengthen the evidence as few studies – randomized trials in particular – have been conducted for this purpose.[1] The existing level of evidence for HBOT may give rise to differences in referral patterns because attitudes rather than facts may be decisive for the choice of treatment. Thus, the aim of this survey was to evaluate referral patterns and attitudes toward HBOT in Denmark.

In Denmark, HBOT is organized by the public health care system. There is a seven-seat, multiplace chamber in Copenhagen University Hospital, while Aarhus University Hospital and Odense University Hospital have one monoplace chamber each. The standard treatment is 30 hyperbaric exposures at 243 kPa for 90 minutes with 5 minutes of compression and 5 minutes of decompression. At the time of this survey, the chamber in Odense had not been installed. All three chambers are available to the general public. At referral, the general practitioner or a hospital department refer the patient to the HBO unit. Funding is provided without need for individual application. Generally, the indications on the UHMS website are considered 'approved indications'.

Patients and methods

In January 2010, the official Danish online healthcare system <www.sundhed.dk> was searched for hospitals with departments of oncology and ENT and oral and maxillofacial (OMF) surgery. Twenty-nine departments were invited to participate in the survey. The survey was conducted using the Enalyzer tool <www.enalyzer.com>.

Results

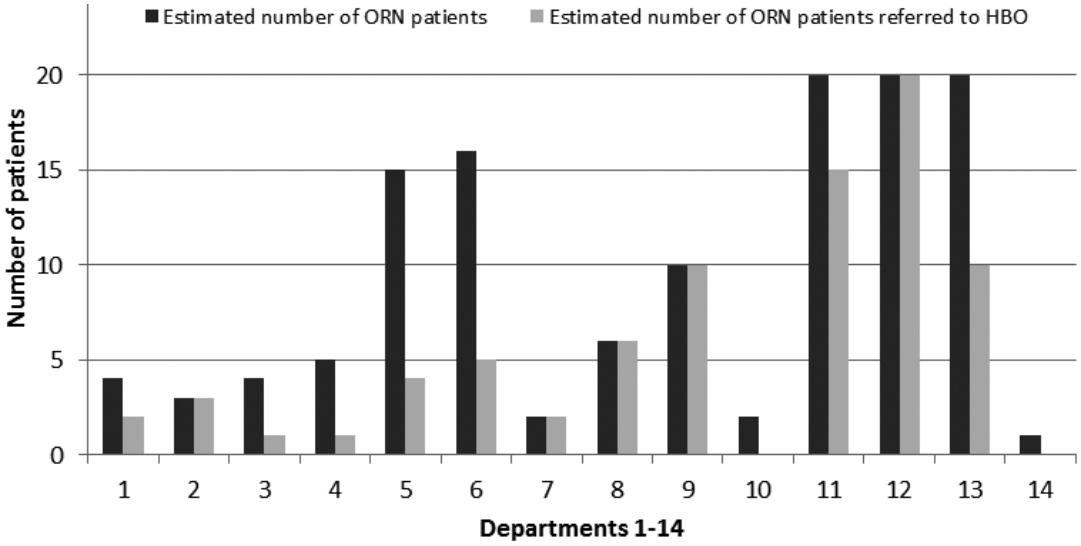
RESPONSE RATES

Twenty-two of the 29 departments responded; nine out of 10 oncologists, seven out of twelve ENT surgeons and six out of seven OMF surgeons. One of the 22 responding did not wish to participate. Of the 21 contributions, four of the answers were incomplete. Fourteen respondents/departments reported to have referred for HBOT at least one patient with ORN within the latest year. Copenhagen University Hospital is a national centre for treatment of ORN and has consequently a large number of patients compared to other centres (Figure 1). Also, the population around Copenhagen is the largest, which explains the higher number of patients at this hospital.

REFERRAL PATTERNS

Of the 14 respondents who had referred at least one case of ORN, 13 responded that they routinely referred patients for

Figure 1



HBOT; no-one reported having stopped referring patients for HBOT having done so in the past. Three respondents reported use of dietary counselling to ORN patients. One of these commented that well-nourished patients appeared to have better ORN recovery. One reported "*no other treatment*". Four reported "*other treatment*". This was further specified as "*antibiotics*" by two respondents, purification and antibiotics by one respondent and an oncologist reported onward "*referral to Department of Oral and Maxillofacial Surgery*".

Eight respondents referred patients to Copenhagen University Hospital; for six, this was the nearest chamber. The other five referred patients to the monoplace chamber in Aarhus University Hospital, whilst two referred to both centres, depending on the patient's wishes, although they were from the region nearest to the monoplace chamber in Aarhus. Reasons for choice of referral centre were mainly 'geographical', whilst one gave "*facilities for the patients*" as the reason, and in another case, the reconstruction surgery to follow HBOT was planned to be in Aarhus. Three did not give any reason.

ATTITUDES

Of the 14 responders, 10 (three oncologists, two ENT surgeons and five OMF surgeons) answered that they believed that "*the treatment is helpful to the patients*". Five believed that the "*effect was questionable*". Nine stated that "*the treatment was generally well accepted among the patients*". Of the responses indicated in our survey to question 8 (see Table 1), six indicated that "*there are patients who do not want this treatment*", while only one stated that "*patients generally do not want this treatment*". This last mentioned respondent (oncologist) was the same one who did not refer patients to HBOT. Additional comments to the question were "*it is difficult to estimate the effect of HBO, since the patients generally also undergo surgery*" (oncologist) and "*the patients feel welcomed in the hyperbaric facility and treated by kind staff*" (OMF surgeon).

Seven respondents reported that one or two patients annually would refuse HBOT for a variety of reasons including travel distances, various physical and psychosocial factors, "*anxiety of the unknown*", "*flash back to radiation treatment*" and a "*lack of guarantee for clinical effect*".

Several respondents reported distance and lack of evidence as barriers for using HBOT. Eight reported "*lack of evidence*". One respondent (oncologist) said that some cases of enhanced tumour growth of recurrent cancer, probably in a hypoxic area, had been observed in their department.

There was a tendency for oncology respondents to be more sceptical than surgeons towards HBOT. Eleven respondents indicated that improved evidence for the beneficial effect of HBOT would influence them to use it more often. There was consistency between what the respondents viewed as barriers to treatment and what they considered as the necessary changes that would result in greater use of this treatment.

Discussion

This survey shows that most referring physicians in Denmark generally consider HBOT helpful to patients with ORN, although they are also critical about the existing level of evidence, seeing this as a major barrier for HBOT. In this respect HBO treatment may no longer be offered to ORN patients if more convincing evidence is not provided. For this purpose, Danish and Dutch research groups have initiated RCTs with participation from other European countries (information available at <www.clinicaltrials.gov>).

A study by Marx showed a therapeutic effect of HBOT on osteo-radionecrosis. Among the 268 included patients, 100% resolved within the three stages of the Marx protocol, 38 in stage I and 48 in stage 2 while 182 progressed to stage 3 before disease resolution.[2] A French randomised study reported a statistically significant better outcome in the placebo arm (32%) than in the HBO arm (19%).[3] However, this study has been widely criticized for its design including issues such as treatment compliance, statistical power, lack of well-defined diagnostic criteria, lack of stratification according to disease severity and potentially leading to bias, since more severely affected cases could have been assigned to one arm or the other.[4] The quality of this study highlights the need for well-designed randomised trials within this field.

In general, departments refer to the nearest regional hyperbaric centre for economic reasons and because of clinical collaborative agreements. However, one department in Northern Jutland, which was nearest to the monoplace chamber, responded that they referred their patients to the multiplace chamber in Copenhagen because of the facilities for the patients. Respondents from the two other departments in Northern Jutland let the patients choose the hyperbaric facility they preferred, despite the geographical relation to Aarhus. This indicates that a culture may develop in one institution which potentially affects clinical decisions. Also, it shows that surroundings and facilities are of great importance to the patients, which seems logical considering the amount of time they spend in the department during their treatment course.

HBOT is well accepted among patients as only one respondent stated that the patients generally do not want this treatment. This respondent was one of the four questioning the effectiveness of HBOT. This indicates that the attitude of the physician may affect the attitude of patients towards the treatment. Apart from this, the barriers for the patients appear mostly to be either geographical, health-related or psychological.

Enhanced tumour growth by HBOT in patients with recurrent cancer is a commonly raised concern. The known effects of HBOT on angiogenesis and cellular regeneration have led to suspicion of a similar stimulation of tumour growth. A Cochrane review has concluded that there is some evidence that HBOT improves local tumour control and mortality as well as local tumour recurrence for head and neck cancer. Other reviews support this conclusion stating that the published literature within this field provides little basis for the opinion that hyperbaric oxygen enhances malignant growth or metastases.[5–7]

In conclusion, further randomized trials are required in order to better determine the role of HBOT for the prevention and treatment of soft-tissue injury and osteo-radionecrosis in head and neck oncology. The importance of a strong multidisciplinary approach between OMF/ENT surgery, oncology and hyperbaric medicine cannot be emphasised enough as this is vital for the success of the treatment. This would be even more successful if the focus was increased on developing better staging systems and international treatment guidelines.

Table 1

Questionnaire sent to the participants; HBOT – hyperbaric oxygen treatment; ORN – osteoradionecrosis

1. Are you an:
   a) Oncologist
   b) Oto-rhino-laryngology surgeon
   c) Oral and maxillofacial surgeon
2. How many ORN patients are diagnosed/treated in your department annually?
3. How many of these were (would you assess) referred to HBOT?
4. What treatment(s), apart from surgery, does your department offer for ORN?
   a) Referral for HBOT
   b) Used to refer for HBOT, but have now ceased
   c) Dietary counselling
   d) No other treatment
   e) Other treatments than above
5. In case of 'other treatment', what treatment(s) do your department offer?
6. If you refer for HBOT, which hyperbaric facilities do you refer to?
   a) Copenhagen
   b) Aarhus
7. What is the reason for referring patients to the chosen facility?
8. What is your departmental experience with HBO-treated patients? (several answers may be chosen)
   a) We think that it is helpful to the patients
   b) We question the effect
   c) The treatment is generally well accepted among the patients
   d) There are patients who do not want this treatment
   e) The patients generally do not want this treatment
   f) Other experiences
9. If other experiences, please describe these:
10. How many patients decline HBOT each year?
11. What do you think is the reason that patients decline HBOT?
12. What barriers are there for HBOT of ORN patients?
   a) Lack of evidence
   b) Distance to nearest HBO unit
   c) Other
13. If other, please specify:
14. What factors could increase the use of HBOT?
   a) Better evidence for the treatment
   b) Distance to nearest hyperbaric unit
   c) Other
15. If other, please specify.

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