THIRD EUROPEAN CONSENSUS CONFERENCE ON HYPERBARIC MEDICINE

THE ROLE OF HBOT IN ACUTE MUSCULO-SKELETAL TRAUMA

MILANO, 4-8 September 1996

RECOMMENDATIONS OF THE JURY*

HBO therapy has to be considered as an adjunctive treatment modality.
Optimal surgery and resuscitation have to be done before or simultaneously.

QUESTION 1- Can HBOT prevent post-traumatic bone hypoxia and post-traumatic edema ?

Until now there is not sufficient evidence to definitively state that HBO can prevent bone hypoxia, and edema. However there is experimental and clinical evidence supporting that HBO act to correct post-traumatic tissue edema and delayed bone healing. (Type 2 statement)

QUESTION 2- Which is the role of HBOT in prevention of reperfusion injury ?

There is some experimental evidence showing a positive effect of HBO in preventing reperfusion injury, but there is not sufficient clinical evidence. However, no study showed a detrimental effect of HBO in increasing the oxydative stress, in injured tissue. (Type 3 statement)

It is strongly recommended that well conducted clinical studies have to be undertaken, because of the existing experimental evidence. (Type 1 recommendation).

QUESTION 3- Which is the role of HBOT in prevention of post-traumatic superimposed infections ?

The procedure of choice is surgery (repeated if necessary), but HBO can be recommended as an adjunctive treatment to enhance antibiotic efficacy, to improve tissue oxygenation and prevent superinfections. (Type 2 statement)

QUESTION 4 and 5- Which is the role of HBOT in improving tissue salvage after acute and subacute musculo-skeletal trauma?

In case of severe tissue damage, with dubious vitality, there is experimental and clinical evidence that HBO improves tissue salvage and clinical outcome. (Type 2 statement)

QUESTION 6- What is the role of HBOT in improving the final clinical outcome in acute and subacute musculo-skeletal trauma?

In cases of open fractures with extensive soft tissue and/or vascular damage (corresponding with type III B/C of Gustillo's classification) adjunctive HBOT is recommended. (Type 2 recommendation)

In less severe cases HBOT adjunctive to surgery can be used in compromised hosts. (Type 3 recommendation)

In every cases HBO is considered, measurement of transcutaneous oxygen pressure is recommended as an index for the definition of the indication and of the evolution of treatment. (Type 2 recommendation)

The cost of the use of adjunctive HBO will be at least compensated by the decrease in morbidity in these patients (e.g. lower amputation rate). (Type 2 statement)

Classification of open fractures and place for HBO as determined by the third ECHM Consensus Conference

Type	Injury	Complication Rate	Comment	HBO
I	small (< 1 cm) laceration from inside to outside	less than 1 %	often managed without formal surgical debridement	No HBO
II	laceration more than 1 cm long without or with minimal soft tissue injury	less than 5 %	excellent results with immediate surgical debridement and later delayed primary closure	No HBO
III Subtype A	crush injury component; adequate soft tissue coverage	infection 4 % amputation 0 %	complication rates little different from types I and II fractures	No HBO
III Subtype B	inadequate (loss of sufficient) soft tissue to cover bone and close wound	infection 52 % amputation 16 %	external skeletal fixation and free grafts have greatly advanced the management of these fractures; complication rates remain high	HBO (type 2 recommendation)
III Subtype C	arterial injury	infection 42 % amputation 42 %	these complication rates exist after arterial repair	HBO (type 2 recommendation)