INCIDENCE OF DIVING-RELATED ILLNESS IN LOMBOK: THE NEED OF COMPREHENSIVE TOURISM MEDICAL CARE?

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Abstract

Diving-related illness is one of preventable health risk when the diving preparation is managed well. Nevertheless, accident happens and tourism authority is responsible in providing diving safety including tourism medical care. Diving safety in tourism medical care is the existence of easily accessible to hyperbaric chamber. To describe the incidence of diving-related illness in Lombok period of December 2014 to January 2015 and to know the need of medical care in managing this illness. Patients of emergency unit in a private hospital is analyzed. Diving-related illness criteria are recent activities of diving in 24 hours before admission, plus one or more symptoms: (1) ear barotrauma, (2) skin reddish and itchy, (3) myalgia-pain (especially in leg), and (4) variety cerebral manifestation. As much 110/1756 (6.3%) emergency unit’s patients are fulfil the criteria. Ratio male/female=66/44, with age mean: 32 (22-53). Diving-illness criteria: ear barotrauma (93), skin reddish and itchy (10), myalgia-pain (87) and cerebral manifestation (0). Fifteen patients is referenced to hyperbaric chamber. Possibility of air-gas embolism could not be evaluated due to in adequate data. The incidence of diving-related illness in Lombok is 6.3%, dominated by male patients. Percentage of symptoms highest to lowest: ear barotrauma (84.5%), myalgia-pain (79.1%), skin reddish and itchy (9.1%). As much 13.6% of these need hyperbaric oxygen therapy.

Keywords: diving-related illness, tourism medical care, hyperbaric oxygen therapy
Introduction

Lombok is one of the tourist areas in Indonesia that rely on marine tourism, including the beautiful and challenging sea garden. It attracts both local and foreign tourists to visit Lombok. Based on data from the Department of Tourism and Culture NTB, the number of tourists in recent years has increased very rapidly. During 2011, the number of tourists who visit Lombok, Sumbawa and another small islands (Gili) reached 886,880 tourists. In the year 2012, the number of visits reached more than 1 million tourists, continues to increase and it is expected in 2015 reaches 2 million tourists.¹

In anticipation of the tourist visits, the government and private sectors continue to improve the infrastructure in tourism services in NTB. Travel agents grow well, some of which offer diving travel packages. Some tourist locations like in Senggigi, Gili Trawangan, Gili Air and a few other places also provide dive training package for tourists who are not familiar to dive.

With the increasing number of tourists who dive as recreational vehicle or learning, there are opportunities for the occurrence of accidents or health problems as a result of these activities. Accidents and health problems related to the dive can be osteonecrosis in caisson disease, poisoning by terapeutic gases, effects of air pressure and water pressure, otitic and sinus barotrauma, decompression sickness, toxic effects of carbon monoxide from all sources, hypothermia, contact with venomous marine animals and plants, trapped in a low oxygen environment, and war operations involving explosion of marine weapons.²

In Lombok island, including some of the Gili, there has been basic and advanced levels of health care facilities. These are carried out by the private sector and also by the government. Lombok has only one piece of hyperbaric chamber which is available in The Head Office Mataram Port Health Services.

The study aimed to describe the incidence of diving-related illness in Lombok period of December 2014 to January 2015 and to know the need of medical care in managing this illness.

Methods

Patients of emergency unit in a private hospital is analyzed. Diving-related illness criteria are recent activities of diving in 24 hours before admission, plus one or more symptoms: (1) ear barotrauma, (2) skin reddish and itchy, (3) myalgia-pain (especially in leg), and (4) variety cerebral manifestation.

Data were obtained from medical records of patient visits during one year (the period from January 1ᵗʰ, 2014 through to December 31ᵗʰ, 2014). Gender, age and patient complaints or diagnosis made by the attending physician when the patient entered the hospital were recorded and entered into the database. The collected data were analyzed descriptively and presented in tables and graphs.

Result

During January 1ᵗʰ – December 31ᵗʰ 2014 recorded 1,756 patients of emergency admission. As much as 110 patients (6,8%) are eligible to criteria. Study flowchart is shown in figure 1.
All patients with history of diving prior 24 hours before admission is analyze. This is including 66 men, youngest-oldest age is 22-55, mean age is 32 years old. The detailed of patients characteristic is shown at table 1.

Table 1. Subject’s characteristic

<table>
<thead>
<tr>
<th>Characteristic</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Subject eligible to inclusion criteria</td>
<td>110</td>
</tr>
<tr>
<td>Male</td>
<td>66 (60%)</td>
</tr>
<tr>
<td>Female</td>
<td>44 (40%)</td>
</tr>
<tr>
<td>Age interval</td>
<td>22-55</td>
</tr>
<tr>
<td>Mean age</td>
<td>32</td>
</tr>
<tr>
<td>Clinical manifestation</td>
<td></td>
</tr>
<tr>
<td>Ear barotrauma</td>
<td>93 (84.5%)</td>
</tr>
<tr>
<td>Skin reddish and itchy</td>
<td>10 (9.1%)</td>
</tr>
<tr>
<td>Myalgia-pain</td>
<td>87 (79.1%)</td>
</tr>
<tr>
<td>Various cerebral manifestation</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Refer to hyperbaric chamber</td>
<td>15 (13.6%)</td>
</tr>
</tbody>
</table>

Table 1 shown that ear barotrauma and myalgia-pain are the common clinical manifestation of DRI found in Lombok, followed by skin reddish and itchy and none in cerebral manifestation.

Discussion

DRI must be recognized in the early phase of incident, otherwise catastrophic result will arise. There are two major group of DRI according to catastrophic result if recompression therapy is not prescribed: firstly mild and steady illness and secondly moderate to severe catastrophic. Mild, reversible and steady such as temporary blur vision, panic attack, mild ear barotrauma and skin injury. Moderate to severe catastrophic: decompression sickness in various manifestation, cerebral air gas embolism.1-4 UHMS, US Navy.
Decompression sickness (DCS) is classified (Modified Golding Classification) in three type: Type 1 DCS, type 2 DCS and type 3 DCS. Type 1 DCS is usually present mild to moderate with clinical manifestation of skin reddish and itchy and myalgia in the leg, fatigue, peripheral nervous system. In the type 2 DCS is neurologic, cardiorespiratory, audiovestibular, shock. While in the type 3 DCS, combined of DCS and air gas embolism.\textsuperscript{5,6,7,8} In this study diagnosis of DRI its self is not established well due to insufficient data.

The incidence of DRI in 10 years of scientific diving in the US is 0.93/10,000 person-dives.\textsuperscript{9} This study unable gain data incidence/ person-dives due to small number of subject/ narrow time spectrum. Furthermore, the study unable to describe diving type into: recreational, guided, exploration, undersea mapping, traditional nor military.

One private hospital that become our study location is a medical facility in Lombok island that often visited by tourists. They are directed by health officials around tourism objects or insurance companies that cooperate with them. This hospital is known to have complete facilities both for the examination and treatment of patients, but there is no a hyperbaric chamber that used to hyperbaric therapy for patients who are experiencing diving related illness.

For instance, one of diving-related cases was found at one private hospital in July 2014. Swedish patient, male, 21 years old, suffered decompression sickness type I. The patient came to the hospital, brought by his friend, complained suddenly not able to move all four limbs since 4 hours prior to hospital admission. Patient had a dive history to a depth of 18 meters at previous day. Patient was fully alert with decreased motor strength. Initially, patient could not move all four limbs, but after observation in less than 4 hours at emergency room, the motor strength increased but did not reach normal motor strength. Proximal portion of all four limbs (thighs and upper arms) were weaker than distal portion. Results of laboratory examination, MRI brain and cervical, also NCS-EMG were in normal range. Hyperbaric therapy was carried out for 4 days in Port Health Office and patient was also given physiotherapy for muscle strengthening exercises. After hyperbaric therapy and physiotherapy, the muscle strength of patient became normal.

Actually, the incidence of DRI is like an iceberg phenomenon. It can happened because the case that we found in some medical centre are a small number of all cases outside medical centre. Several patients didn’t know they are suffered from DRI, on the other hand, several health professional also can not established the diagnosis well. For example, few weeks ago, investigators met 2 patient who were traditional divers. They feel their hearing is decrease and dizziness after 1.5-2 hours routin diving for cathcing fish. They used an unstandardized equipment for diving. Based on phisical examination, the first patient found a perforation in right eardrum while the right side is normal, on the other hand, the second patients is normal. Hearing test level for the first patient found severe sensorineural hearing loss while the second patient is moderate sensorineural hearing loss. Both of this patient should be threat with hyperbaric therapy to recover their hearing and dizziness.

In Lombok island, there is only one health facility that has a hyperbaric chamber, namely Port Health Office. If there are patients who experienced diving related illness, they should be referred to the Port Health Offices to get hyperbaric therapy. This procedure becomes less efficient. So it is desirable to other medical facilities in Lombok island has hiperbaric chamber with 24 hours operation to treat patient with diving related illness. Also In order to increase physician capacity in recognizing DRI, Faculty of Medicine Mataram University has already developed medical tourism curriculum as part of marine medicine.\textsuperscript{10}
References


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