

Decompression illness in Japanese Ama divers : a questionnaire survey

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DCI in breath-hold diving

➤ Professional:

Cross. 1962, 1965

Kohshi. 1998, 2000, 2001

Batle. 1999

➤ Recreational:

Magno. 1999

Wong. 1999

➤ After compressed air exposure :

Haavelsrud. 1963

Paulev. 1965

Materials & Methods

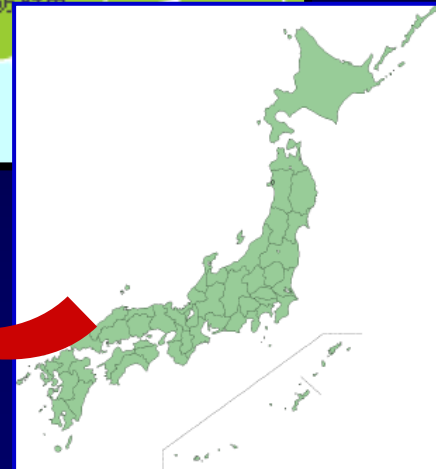
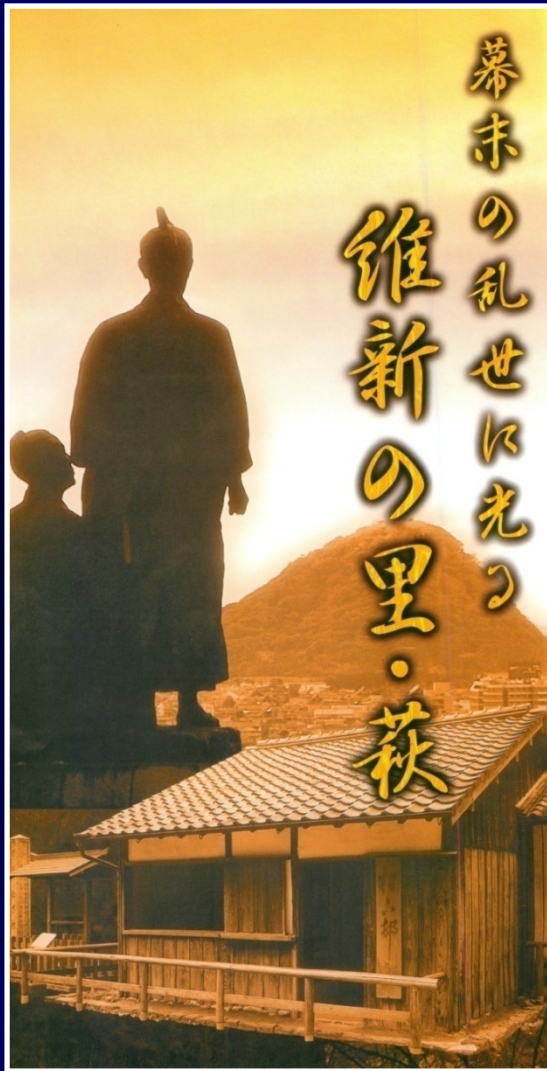
1. All 381 Ama divers

(M/F: 346/35; assisted/non-assisted: 39/342)
belonging to the Abu-Hagi district, Japan

2. A questionnaire survey

- 1) diving types: assisted/non-assisted
- 2) diving patterns: depth, diving time, surface interval, diving shifts,
- 3) diving accidents: physical and neurological
- 4) medical history: hypertension, arrhythmia, diabetes, stroke,

Hagi city, Yamaguchi, Japan



New Japan was born in this area 150 years ago

Results

Responders : 185 / 381 (48.6%)

M/F : 175 / 10

assisted : 28 / 39

non-assisted : 157 / 342

Stroke-like events : 12 / 185 (6.5%)

assisted : 11 / 28 (39.3%)

non-assisted : 1 / 157 (0.6%)

Diving accidents in Ama

Stroke-like symptoms (12)

- paresthesia: 7
- motor weakness: 6
- speech: 3
- visual: 1

Accompanied symptoms (10)

- dizziness: 8
- vertigo: 2
- nausea: 2
- limb pain: 1

Diving profiles of Ama with DCI

- **All 12 male divers** : 42-71 y (median: 56 y),
working time: 8:00-15:00 (30-min lunch break)
diving duration (am/pm): 4.5-5.5 hrs (3-4/1-2 h)
- **11 partially assisted**: using 15-20-kg weight
depth: 10-20 msw
diving time: 30-75 sec,
surface interval: 10-40 sec
- **1 non-assisted diver**
depth: 12 msw
diving time: 60 sec,
surface interval: 120 sec

Risk factors for DCI in Ama

- Diving patterns: assisted ($p=0.0001$)
- Diving depth : >10 m ($p=0.0001$)
- Diving time : > 60 sec ($p=0.0043$)
- Surface interval : < 60 sec ($p=0.0494$)
- Medical history: hypertension, cardiac arrhythmia, diabetic mellitus : ($p>0.5$)

Conclusions

- High rates of neurological DCI :
in assisted Ama divers
- Main symptoms :
stroke-like (numbness, motor weakness,
speech disturbance, etc.), transient
- Main mechanisms :
“trapped bubbles” in pulmonary arteries?