Is Acetazolamide Still the Best Option?
- A Retrospective Review to Identify the Optimal Approach for Preventing Acute Mountain Sickness -

AMSA Japan

Miyuka Kushibe*, Hibiki Yamazaki,

Riko Shima, Ayuna Mizuno, Keigo Sano,

Kotomi Okita, Yudai Kaneda

Faculty of Medicine, University of Debrecen*

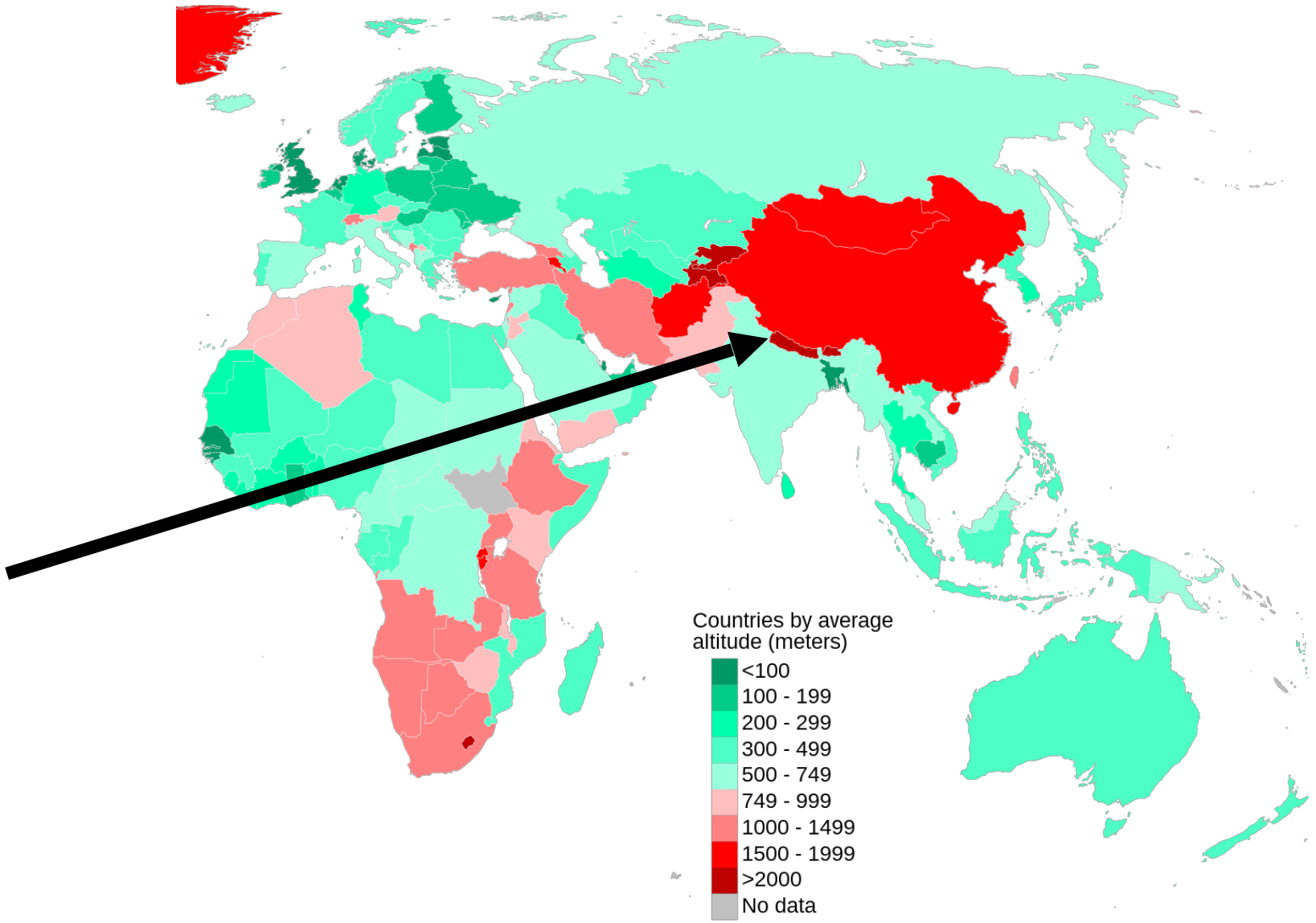
rcjapan@amsa-international.org*

AMSA J

Nepal is way above other countries

Kathmandu
1400m

Nepal
3625m (Avg)



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If you have headache, fatigue….
might be AMS (Acute Mountain Sickness)!?

Common in **rapid ascent**

to altitude **greater than 2500m**

Symptoms

Headache

Fatigue

Breathlessness

Sleep Disturbance

Vomiting and Nausea

Improvement areas of Acetazolamide

1. Other complicated mechanisms have been proposed

A. Improvements in ventilation from tissue respiratory acidosis by ↑CCR

B. Improvements in sleep quality from carotid body CA inhibition

C. Diuresis effect in AMS is not well established

2. Poor availability

A. Use of prophylactic AMS is not covered by insurance

B. Prescription is required

Is Acetazolamide Still the Best Option?

Ibuprofen?

Ginkgo Biloba?

Dexamethasone?

Objective

Compare the efficacy and side effects of dexamethasone, ibuprofen and ginkgo biloba to acetazolamide

↓

Evaluate the optimal medication for acute mountain sickness

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Method

Search in Pubmed

2005-2022

Keywords :

AMS

Prevention

Acetazolamide

Dexamethasone

Ibuprofen

Ginkgo Biloba

Gather information

On pharmacological measures' efficacy on the prevention of AMS

Evaluate the efficacy

Descriptive statistics

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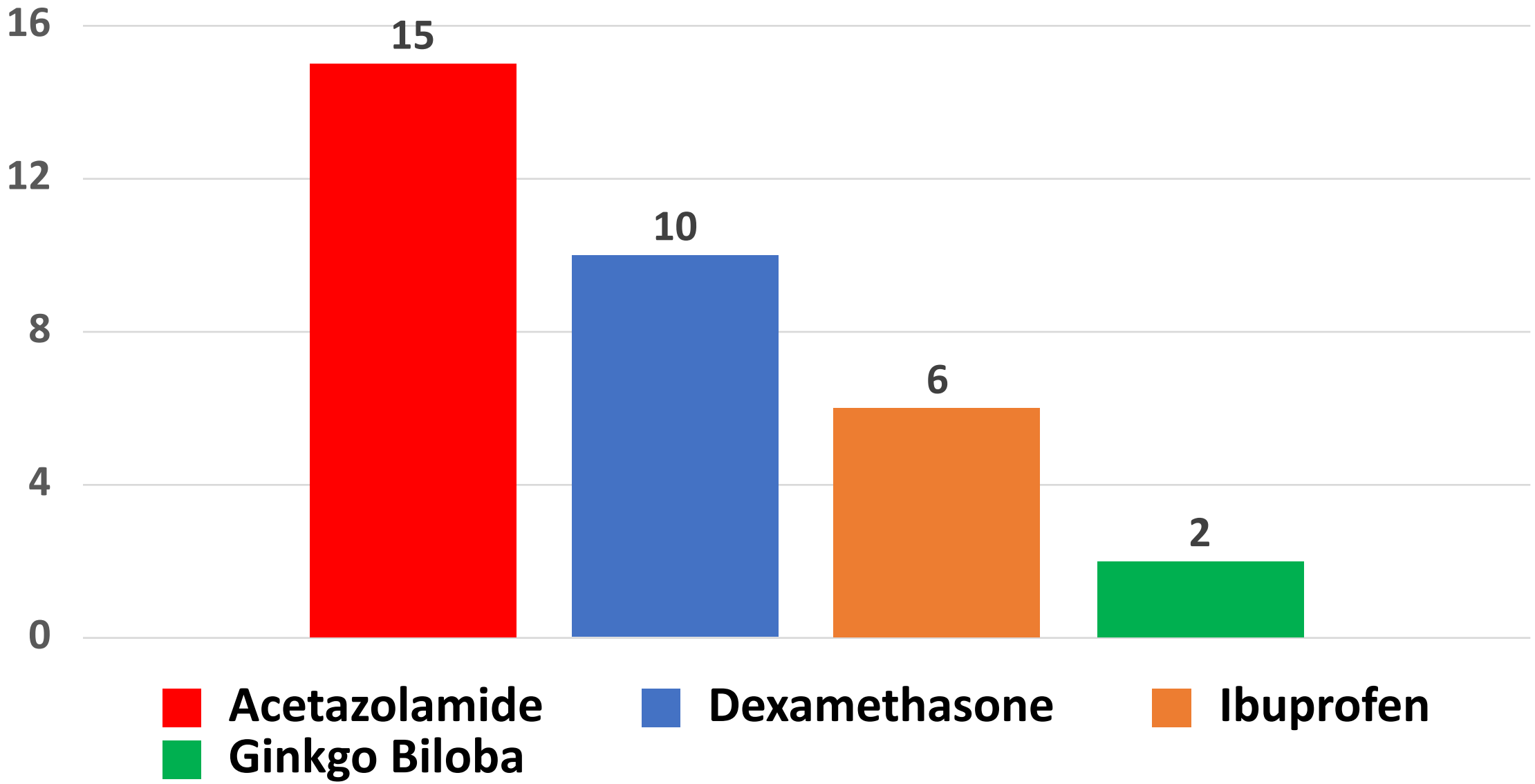
The number of published articles



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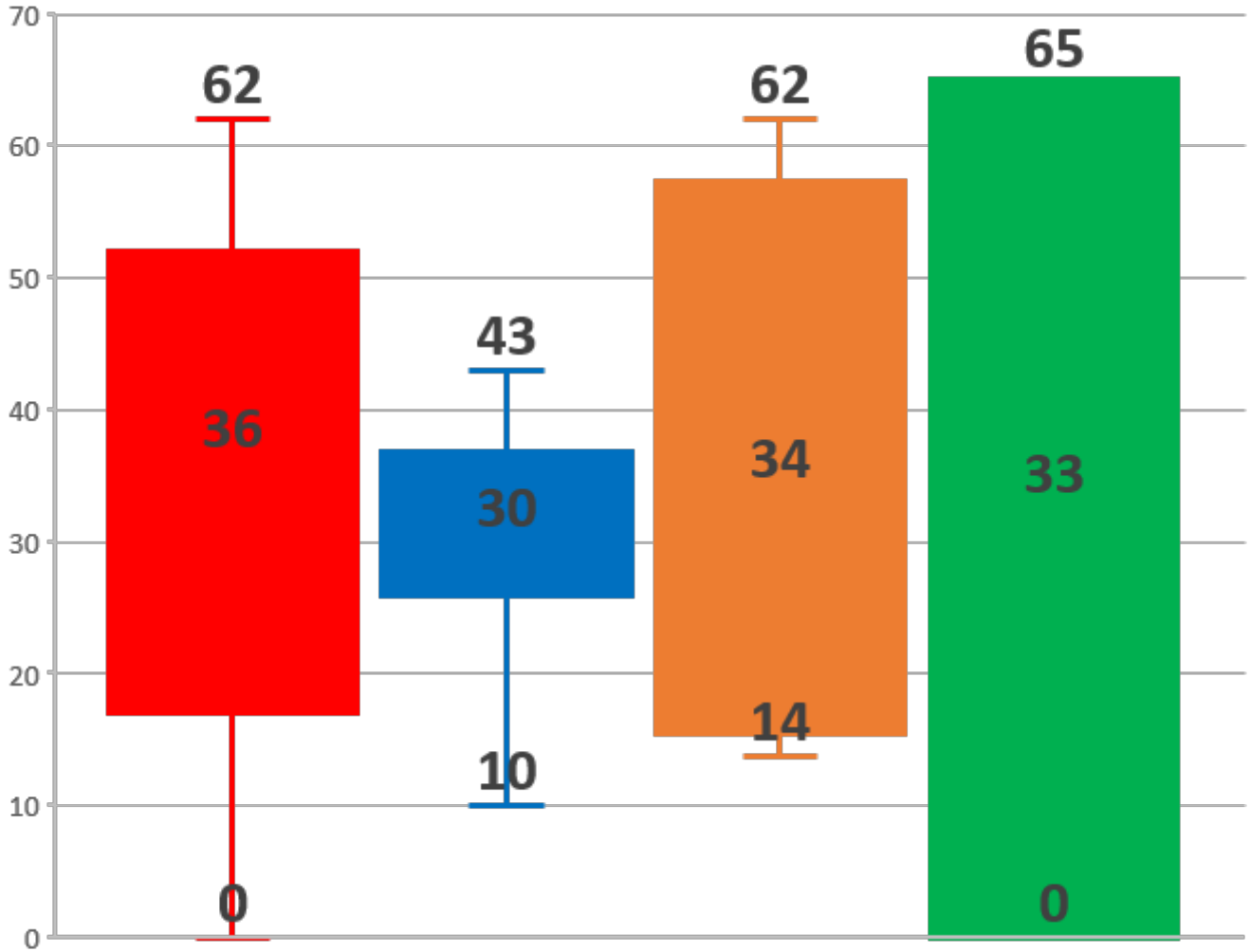
Results -Incidence rate

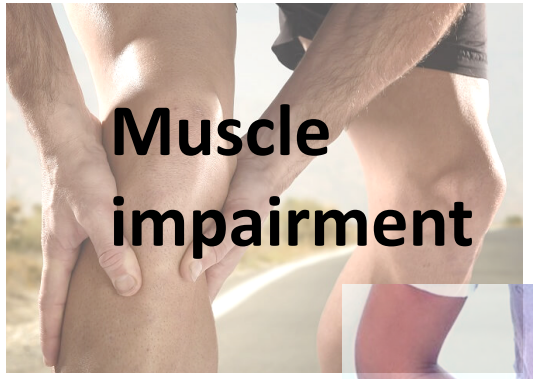


The incidence of AMS was best prevented by Dexamethasone!

	Median
Acetzolamide	36%
Dexamethasone	30%
Ibuprofen	34%
Ginkgo Biloba	33%

Results - Side Effects

Acetazolamide



Dexamethasone

Not mentioned (by the method)

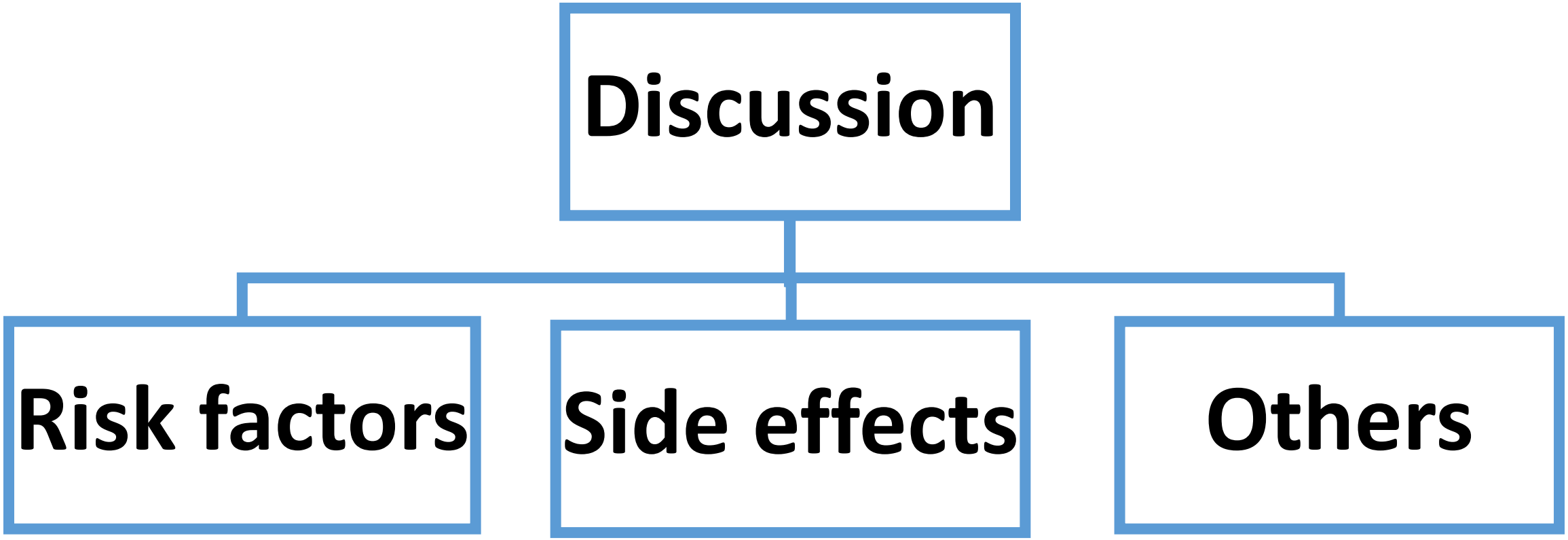
Ibuprofen

No major adverse events

Ginkgo Biloba

Discussion

Which drug is suitable?



Discussion 1 - Risk factors -

○ Low risk

	Acetazolamide	Dexamethasone	Ibuprofen	Ginkgo Biloba
Diabetes Mellitus			△	?
Pregnancy, Infants	○			○
Hypertension	○			○
Bleeding disoder	○	○		
NSAIDs, Aspirin allergy	○	○		
Liver and renal diseases		○	○	○
Respiratory disorders		○	○	○

Discussion 2 - Side effects -

Dose	AMS	Side effects
Low	↑	↓
High	↓	↑

Ibuprofen < Acetazolamide < Dexamethasone

*[1] Severeness and incidence

*[2] Insufficient data on side effects of Ginkgo Biloba

Discussion 3 - Others -

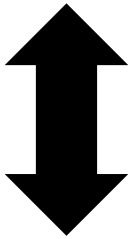
	Pros	Cons
Acetazolamide	Assist with **acclimatization** Lower risk for gastrointestinal symptoms	Lower availability **Unrevealed mechanism**
Dexamethasone	Safe for Sulfa allergy Used for any degree of AMS	Does **not** facilitate **acclimatization**
Ibuprofen	Better availability (OTC) Quick effect	Does **not** facilitate **acclimatization** (ventilatory) Mask headache → misdiagnosis
Ginkgo Biloba	OTC	Inconsistent effect Undefined effective dose

Discussion 4

All things considered…

Western medicine
- -Acetazolamide
- -Dexamethasone
- -Ibuprofen

Contain only **one** kind of active ingredient
→The pharmacological effect can only be expected from that **ingredient alone**



Combination

Eastern medicine
- -Ginkgo Biloba

Made by
combining a **variety** of crude drugs
and utilizing their pharmacological actions and interactions

Discussion 5

Western medicine
- **-Acetazolamide**
- **-Dexamethasone**
- **-Ibuprofen**

Combination
The best of both

Eastern medicine
- **-Ginkgo Biloba**

All things considered…

Mild AMS

Ginkgo Biloba × Acetazolamide

Mild or Severe AMS

Ginkgo Biloba × Dexamethasone

Prevention < Treatment

Ginkgo Biloba × Ibuprofen

- **Treat side effects of western medicine**
- **Lower the dose of western medicine**
  →Less side effect
- **Synergy**

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Strengths

- Our research material includes latest articles that were published between 2005 and 2022

→**Coverage** of the results is high

Limitations

- Drugs efficacy depends on multiple factors

→ But **not taken into account** in this research

- Total number of data about the drugs' efficacy → **low**

- Effectiveness of each drug was evaluated individually

Conclusion

- The **incidence** of AMS

Dexamethasone < Ginkgo Biloba < Ibuprofen < Acetazolamide

- A **combination** of drugs may be more effective

Recommendation

- Investigation of **mechanism** may lead to **diminished side effects**
- Study taking into account the **limitations**
- Analysis of **combination**
- High altitude research can be also applied in **hypoxia associated diseases** in **low altitudes**

Acknowledgements and Conflict of Interest

Acknowledgements

- We would like to acknowledge AMSA Nepal for organizing this academic competition!

Conflict of interest

- None

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Authors

Miyuka Kushibe
Author, Presenter

Hibiki Yamazaki
Author

Riko Shima
Author, Presenter

Ayuna Mizuno
Author, Presenter

Keigo Sano
Author

Kotomi Okita
Author

Yudai Kaneda
Author


Thank you