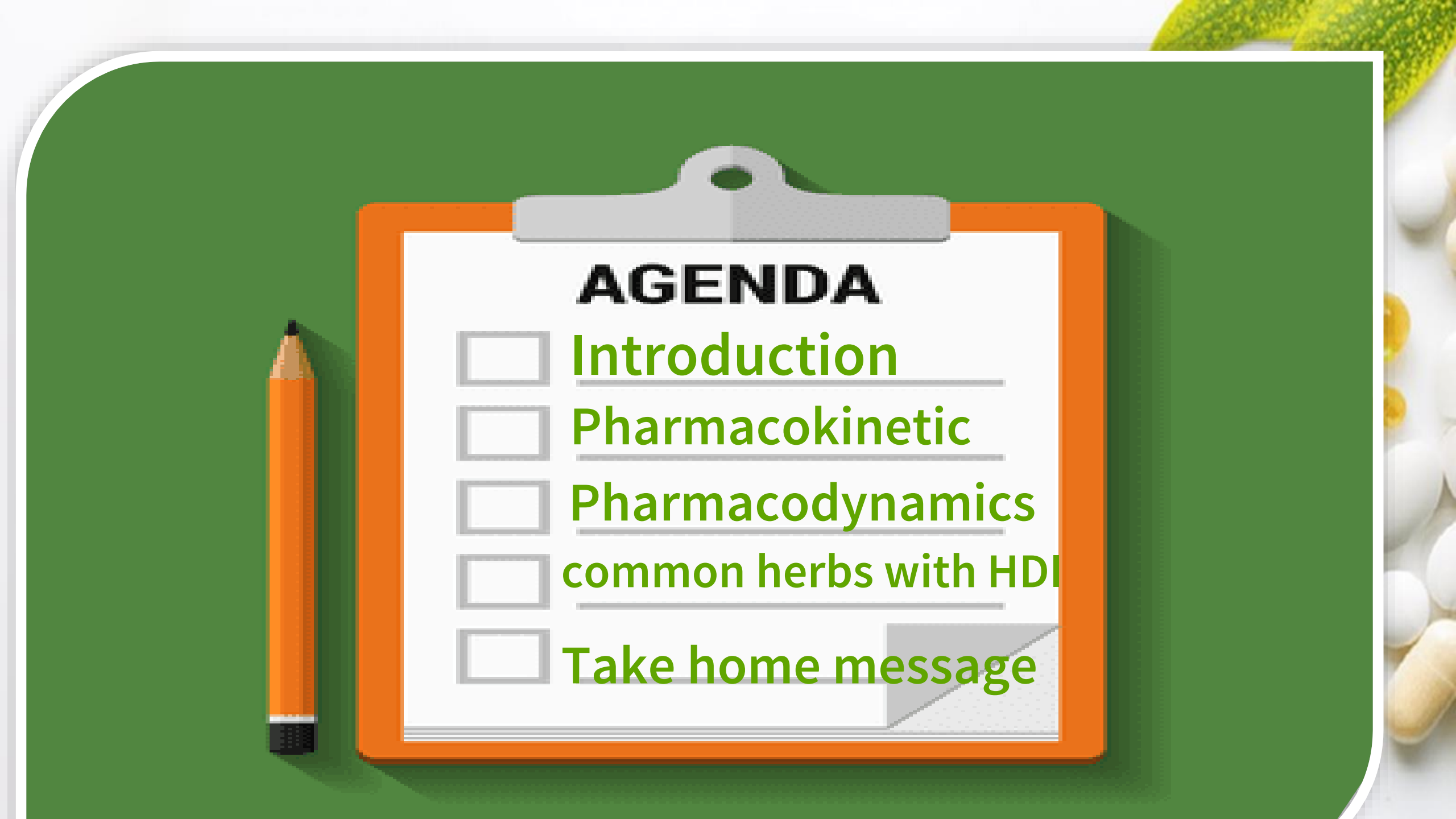
Herbal Drug Interactions

Clinical & Mechanistic Insights

Asmaa Badawy
Suez University


AGENDA
Introduction
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common herbs with HDI
Take home message

Introduction

Why ?

- The World Health Organization (WHO) estimates that 80% of the world's population use herbal medicine
- Medicine history was initiated from herbal medicine itself
- With the origin of Islam in 7th century, the knowledge about prevention of disease and cure are known as Tibb Al-Nabawi by Muslim society originated hundreds of years ago and are still in use

وضع ابن سينا القانون في الطب

وضعَ ابنُ البَيطار الموسوعةُ النباتيَّة المسماةُ الجامِعَ لِمُفرَداتِ الأدويَةِ والأغذيَة

Herb–drug interactions?

It has become clear that both conventional and herbal medicines are often used concomitantly and this can lead to clinically relevant HDIs may be:

- beneficial
- harmful
- even fatal

Mechanisms of HDIs

a single herb contains multiple phytoconstituents that may be biologically active and capable of modulating physiological actions, similar to therapeutic drugs

HDIs are mediated by pharmacodynamic and/or pharmacokinetic mechanisms.


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Introduction


Pharmacokinetic

Pharmacokinetic HDIs

Pharmacokinetic HDIs may occur at any step of absorption, distribution, metabolism, and excretion (ADME)

Pharmacokinetic HDIs

Pharmacokinetic HDIs may occur at any step of (ADME):

absorption

distribution

metabolism

excretion

Pharmacokinetic HDIs

Absorption interactions

1- herbal laxative or bulk-forming agent will speed up the intestinal transit, and thus may interfere with the intestinal absorption as senna

2- the presence of the drugs belonging to the class of antacids, systemic antiulcer agents, which will increase the pH of stomach, the absorption of weak acidic herbal extracts/formulations may get affected and vice versa

Pharmacokinetic HDIs

Distribution interactions

These interactions may occur with drugs having higher plasma protein-binding property (>95%), and narrow therapeutic window (NTW) As warfarin

tea and green leafy vegetables interact with warfarin by either increasing or decreasing its effectiveness leading to prolonged bleeding or increasing the risk of blood clotting, respectively.

Pharmacokinetic HDIs

Metabolism interactions

Herbal ingredients can alter metabolizing enzymes through induction and/or inhibition. of CYPs

garlic is a competitive inhibitor of CYP2E1.

St John's wort is also a potent noncompetitive inhibitor of CYP2D6

Pharmacokinetic HDIs

Elimination interactions

The sources of drug elimination from the body are urine, feces, sweat, tears, semen, menstrual discharge.

some herbs are known diuretic, which can affect the excretion of medicinal drugs


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Pharmacodynamic

Pharmacodynamic HDIs

Pharmacodynamic interactions
occur mainly at receptor level and are classified as direct and indirect HDIs.

Medication could be of further risk when used with dietary supplements/herbal medicines that share these pharmacological activities


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Common herbs

CRANBERRY

cranberry increasing warfarin concentrations and international normalized ratio (INR)

CURCUMIN

curcumin induces CYP1A2, which could cause decreased levels of many antidepressant and antipsychotic medications

GINKGO

Inhibit platelet aggregation, which could theoretically increase bleeding risk, especially in combination with antiplatelet or anticoagulant drugs

GINSENG (ASIAN)

induce CYP3A4, which could decrease the effectiveness of many drugs, including

- calcium channel blockers,
- many chemotherapy
- HIV agents,
- certain antihypertensive and
- statins
- some antidepressants.

GREEN TEA EXTRACT

green tea extract has been shown to increase simvastatin concentrations

ST. JOHN'S WORT

potent inducer of CYP3A4 leads to reductions in cyclosporine, tacrolimus, warfarin, protease inhibitors, theophylline, digoxin, and oral contraceptives.

It is strongly recommended to avoid concurrent use of St. John's wort with over-the-counter and prescription medications


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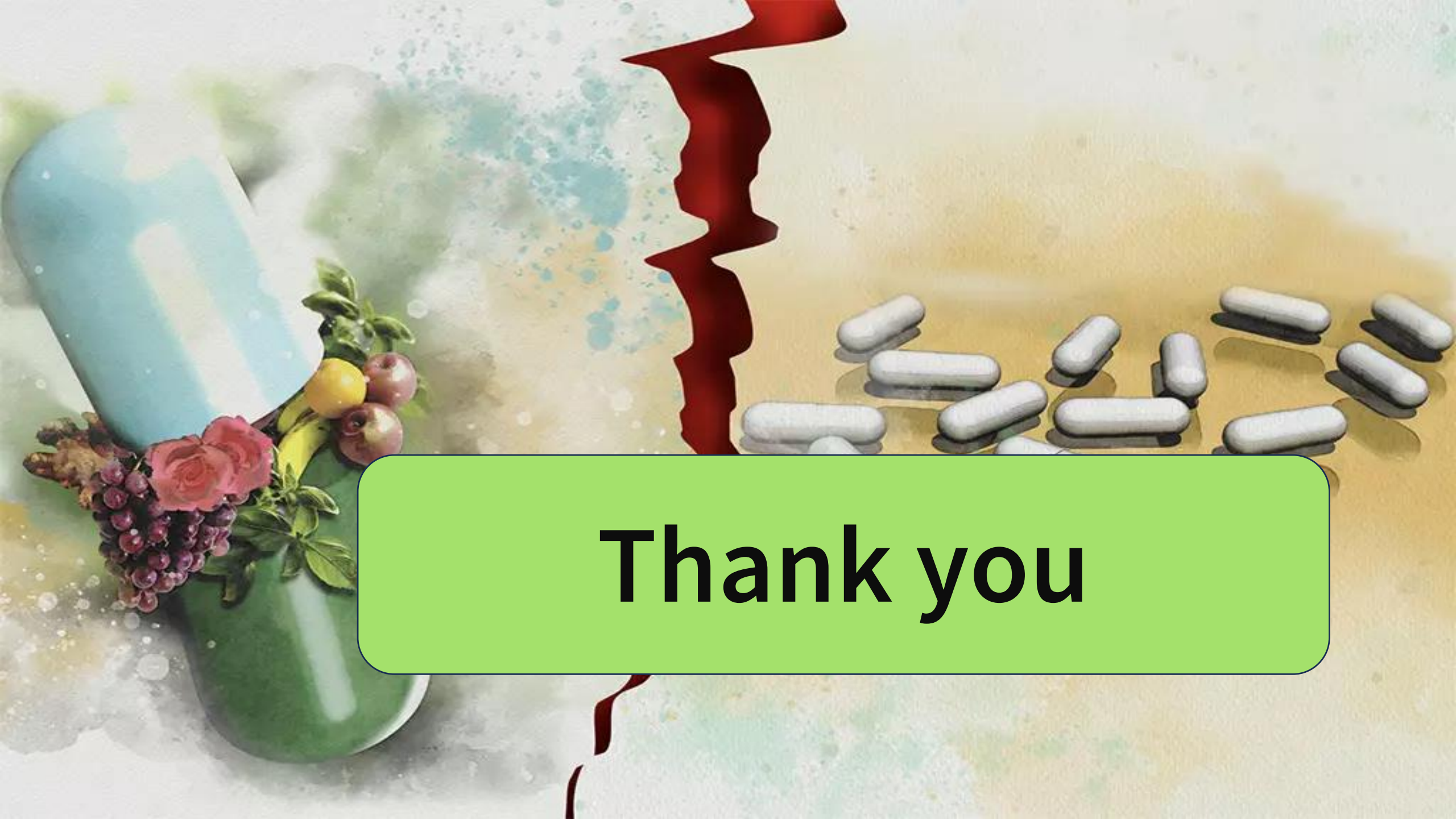
Take home message

Take home

- Herbal medicine not always safe.
- Always consider patient history including supplements .
- Need for multidisciplinary awareness (physicians, pharmacist ,Herbalist).

References

- WHO
- American family physicians
- Biomedical journal
- (Al-Rumkhani et al., 2016).


Thank you