

INTISARI

Kanker merupakan salah satu penyakit tidak menular yang menyebabkan kematian tertinggi di dunia. Kurkuminoid merupakan senyawa fenolik yang berasal dari kunyit (*Curcuma longa* Linn.) yang umumnya digunakan sebagai zat aditif makanan dan zat aktif obat. Review ini bertujuan untuk meninjau kurkuminoid, kurkumin, demetoksikurkumin, dan bisdemetoksikurkumin sebagai senyawa yang memiliki potensi aktivitas antikanker payudara tertarget *Tumor-Promoting Inflammation*.

Penelitian berbasis *Literature review* berdasarkan metode pencarian PRISMA. Artikel yang disertakan dipublikasikan pada rentang waktu Februari 2011 hingga Februari 2021. Ditemukan 1697 artikel dari *database* PubMed, Science Direct, Scopus, dan Garuda. Sebanyak 35 artikel disertakan berdasarkan kriteria inklusi dan eksklusi serta proses skrining.

Pada *review* ini ditemukan bahwa kurkumin maupun kurkuminoid lain menunjukkan aktivitas antikanker payudara melalui beragam cara, khususnya peningkatan aktivitas apoptosis dan penghambatan proliferasi melalui *cell cycle arrest*. Aktivitas antikanker payudara kurkuminoid menargetkan jalur inflamasi, khususnya penghambatan protein terkait jalur NF κ B *signaling*, protein JNK dan p38 jalur MAP Kinase, serta protein spesifik STAT3 dan JAK2 jalur JAK-STAT. Kurkuminoid juga menunjukkan aktivitasnya dalam menghambat kemampuan sel kanker payudara dalam bermigrasi, berinvasi, dan bermetastasis melalui penghambatan protein jalur Wnt *signaling* dan mencegah degradasi ECM. Pengembangan efektivitas kurkuminoid dapat melalui formulasi nanokurkumin atau sintesis analog dan turunan kurkumin. Penggunaan kurkuminoid bersama senyawa/obat antikanker lain dapat secara sinergis meningkatkan efektivitas obat/senyawa tersebut serta memperbaiki kekurangan monoterapi masing-masing senyawa, seperti stabilitas yang buruk dan efek samping klinis dari senyawa antikanker.

Kata Kunci: Kanker Payudara, Kurkuminoid, Kurkumin, Demetoksikurkumin, Bisdemetoksikurkumin, Inflamasi

ABSTRACT

Cancer is a leading cause of Non-Communicable Diseases (NCDs) death. Curcuminoid, a phenolic compound found in turmeric (*Curcuma longa* Linn.), is a component that has been used as food additives and active component in drugs. This review aims to evaluate the role of curcuminoids, curcumin, demethoxycurcumin, and bisdemethoxycurcumin as tumor-promoting inflammation-targeted anticancer activities in breast cancer.

This literature review was conducted according to PRISMA guidelines. Articles included were published on February 2011 - February 2021. 1697 articles were found in database of PubMed, Science Direct, Scopus, and Garuda. 35 Articles were included in this review according to inclusion criteria and screening processes.

The findings in this review indicated that curcumin and other curcuminoids showed various anticancer activities, specifically through apoptosis induction and inhibition of cell proliferation through cell cycle arrest. Anticancer activities of curcuminoids through targetting inflammation pathways, particularly inhibiting NFκB signaling pathways, JNK and p38 protein activities on MAPK signaling pathways, and STAT3 and JAK2 specific protein activities on JAK-STAT signaling pathways. Curcuminoids also showed its anticancer activities in suppressing breast cancer cells' growing abilities, including migration, invasive, and metastatic abilities through inhibiting Wnt signaling pathways and ECM degradation. The developments of curcuminoids can be occurred through nanoformulation of curcumin or synthesis of its analogs and derivatives. Co-administration of curcuminoids with other anticancer compounds can synergistically increases its effectiveness and ameliorates their disadvantages as a monotherapy, such as poor stability and clinical side effects of each compounds..

Keywords: Breast Cancer, Curcuminoid, Curcumin, Demethoxycurcumin, Bisdemethoxycurcumin, Inflammation