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Preference-ranking of used regimens in neo-adjuvant chemotherapy for the treatment of breast cancer patients through network meta-analysis

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Background: Effectiveness of regimens of Neoadjuvant Chemotherapy (NACT) involving Anthracyclines, taxane, trastuzumab, bevacizumab and their combinations reported to have contradictory findings. No previous study has compared all these regimens simultaneously so unable to rank them. Hence, present study aims to rank these regimens on the basis of effectiveness.

Material and Methods: For this study, a systematic review revealed 23 eligible randomized controlled trials identified through PubMed and Cochrane database of controlled trials. The Risk of Bias and publication bias were assessed by Cochrane Risk of Bias assessment tool and comparison adjusted funnel plot respectively. The network meta-analysis model was used to assess the relative effectiveness (using relative risk & 95% CI) of these regimens in terms of pathological complete response (pCR). The regimens were ranked by the surface under the cumulative ranking curve

(SUCRA).

Results: Targeted therapies, i.e., Trastuzumab and Bevacizumab had significantly better rate of pCR in comparison to anthracycline and taxane together as well as anthracyclines or taxanes alone. Further, taxane and anthracycline together was found better than anthracycline alone. The ranking of treatment on the basis of SUCRA probability revealed Trastuzumab as most effective treatment followed by Bevacizumab, Other targeted therapy (than trastuzumab and bevacizumab), Anthracycline with Taxane, taxane alone and finally Anthracycline alone as least effective treatment.

Conclusion: For a better pCR, appropriate use of targeted therapy, especially trastuzumab for HER2 positive breast cancer, and Bevacizumab for HER2 negative breast cancer, may be a better choice.