

Literature search strategy

The PubMed database was searched on 16 July 2021 for published evidence on neutralizing antibody (NAb)-induced secondary non-response and the frequency of NAb formation in aesthetic use of botulinum toxin type A (BoNT-A). The search strategy included synonyms and medical subject headings for botulinum toxin, treatment failure, immune response, resistance, and tolerance. The complete list of search queries is available in the section on PubMed search queries.

Selection of studies

Articles were included if they had relevant data on outcomes of BoNT-A aesthetic indications. Systematic reviews and meta-analyses (SR/MAs), clinical studies, case reports, and case series were included. Articles were excluded if they were non-English publications, did not have relevant data on outcomes of BoNT-A in medical and aesthetic indications, or were not the specified publication types.

Publications identified

A total of 1092 records were identified through database searching; one additional record was identified through a hand-search. After screening, eighteen relevant publications were identified; three SR/MAs, two SRs, six clinical studies, five case reports, and two case series publications.

PubMed search queries

Search parameters	Keywords	Search term/synonyms
Intervention	Botulinum toxin	"Botulinum neurotoxin A" OR "Botulinum toxin A" OR "Botox" OR "Vistabel" OR "Dysport" OR "Azzalure" OR "Xeomin" OR "Bocouture" OR "Botulinum toxin" OR "Onabotulinumtoxin A" OR "OnabotulinumtoxinA" OR "Abobotulinumtoxin A" OR "AbobotulinumtoxinA" OR "Incobotulinumtoxin A" OR "IncobotulinumtoxinA" OR "Clostridium botulinum A Toxin" OR "Nabota" OR "Jeuveau" OR "PrabotulinumtoxinA" OR "Botulax" OR "LetibotulinumtoxinA" OR "Meditoxin" OR "Neuronox" OR "NeubotulinumtoxinA" OR "Lantox" OR "Prosigne" OR "Hengli" OR "LanbotulinumtoxinA" OR "CBTX-A"
Outcomes	Treatment failure	"Treatment failure" OR "secondary treatment failure" OR "therapy failure" OR "secondary therapy failure" OR "complete secondary treatment failure" OR "antibody-induced secondary failure" OR "antibody-induced treatment failure" OR "complete unresponse" OR "non-response" OR "nonresponse" OR "non-respons*" OR "secondary non-response" OR "secondary nonresponse"
	Immune response	"immunogenicity" OR "immunogenic potential" OR "immune response" OR "neutralizing antibodies" OR "neutralising antibodies"
	Resistance	"Immuno-resistance" OR "immune resistance" OR "clinical resistance" OR "resistance" OR "resistant" OR "treatment resistance" OR "toxin resistance"
	Tolerance	"Treatment tolerance" OR "Tolerance" OR "Partial response" OR "Partial non-response" OR "Partial secondary non-response" OR "Partial secondary treatment failure"