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## **Procedural success of left atrial appendage occlusion device in patients with chronic kidney disease: Meta-analysis of real-world data**

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**Objectives:** Percutaneous left atrial appendage occlusion (LAAO) devices are a therapeutic alternative used for the prevention of stroke in patients with atrial fibrillation (AF). Population with chronic kidney disease (CKD) are at high risk of procedural complications after transcatheter intervention; however, there is no meta-analysis on procedural success in CKD vs. non-CKD population receiving LAAO interventions. Hence, we meta-analyzed the evidence from real-world evidence (RWE) studies reporting the procedure success of LAAO in CKD population compared to the non-CKD population.

**Methods:** PubMed, EMBASE, and Cochrane database were searched, from inception to January 2020, for published RWE studies reporting the procedural success rate for LAAO device implantation in patients with or without CKD. Two researchers independently screened search results and extracted data for study details (design, follow-up, assessment etc.), outcome results (procedure success rate), and conclusion. The quality of the included studies was assessed using Newcastle-Ottawa Scale (NOS) and random-effect model was used for meta-analysis.

**Results:** Of 45 articles identified, four studies (2 from Germany, 1 from China, and 1 multinational) comprising 678 CKD and 978 non-CKD patients receiving LAAO fulfilled the inclusion criteria. CKD was defined as an eGFR <60 ml/min per 1.73 m<sup>2</sup> across studies. Three studies reported procedural success rate as successful implantation and absence of significant residual leak (≥5 mm). The mean age was above 70 years and Amplatzer cardiac plug was used in most of the LAAO procedures (68%, n=1122), across studies. The meta-analysis showed a similar procedural success rate for LAAO procedure (CKD=98.4 and non-CKD=96.9) with a pooled risk difference of 0.01 [(95%CI: 0.00-0.03), p=0.07]. The majority (n= 3) of the studies were of high quality.

**Conclusions:** This meta-analysis showed that the procedural success rate of LAAO did not differ between the CKD and non-CKD patients. Hence, LAAO has similar procedural safety for patients with and without CKD.

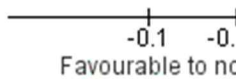
Study characteristics

Study	Country	Follow-up	CKD assessment
Brockmeyer 2019	Germany	Mar 2012 - Mar 2016	Patients with an eGFR <60 ml/min were assigned to the CKD group.
Xue 2018	Germany	Feb 2012 - Jan 2017	CKD was defined as an eGFR 60 ml/min per 1.73 m <sup>2</sup>
So 2018	China	Jun 2009 - Aug 2017	The presence or absence of CKD was based on eGFR cut-off of 60 ml/min using CKD-EPI equation.
Kefer 2016	Multinational	Dec 2008 - Nov 2013	CKD was defined as eGFR <60 ml/min per 1.73 m <sup>2</sup>

CKD: Chronic kidney disease; eGFR: Estimated glomerular filtration rate; f: female; LAAO: left atrial appendage ablation

Meta-analysis of the LAAO procedure success in CKD vs non-CKD population

Study or Subgroup	CKD		Non-CKD		Weight	Risk Difference M-H, Random, 95% CI	M-I
	Events	Total	Events	Total			
Brockmeyer 2019	81	81	63	65	9.2%	0.03 [-0.02, 0.08]	
Kefer 2016	149	151	145	149	22.1%	0.01 [-0.02, 0.05]	
So 2018	69	71	122	125	10.1%	-0.00 [-0.05, 0.04]	
Xue 2018	368	375	618	639	58.6%	0.01 [-0.01, 0.03]	
<b>Total (95% CI)</b>		<b>678</b>		<b>978</b>	<b>100.0%</b>	<b>0.01 [-0.00, 0.03]</b>	
Total events	667		948				
Heterogeneity: Tau <sup>2</sup> = 0.00; Chi <sup>2</sup> = 1.03, df = 3 (P = 0.79); I <sup>2</sup> = 0%							
Test for overall effect: Z = 1.81 (P = 0.07)							



-0.1    0.03  
Favourable to non-CKD