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The Link between Antipsychotic Use and Post-stroke Infections : Propensity Score Matching Analysis

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Background and Objective

Antipsychotics are commonly prescribed to manage psychosis or delirium in the geriatric population. Although previous reports have suggested the increased infection risk associated with antipsychotics use, the studies on the association of antipsychotics and infection in post-stroke patients are scarce. Therefore, in this study, we used a multi-center cohort obtained from clinical data warehouse to explore whether the use of antipsychotics is associated with an increased risk of post-stroke infection in the elderly population.

Method

This retrospective cross-sectional study included adult population diagnosed with first-ever stroke (ICD-10 code I60, I61, I63, I64) between January 2011 and December 2020 in five university hospitals in Korea. Data were extracted from electronic medical records. In-hospital antipsychotic exposure was defined as any administration during the stroke hospitalization. In order to adjust for confounding factors, propensity score matching was applied. The primary outcome was the post-stroke infection during the stroke hospitalization, and the secondary outcomes were the presence of culture-positive bacteremia, pneumonia, and bacteriuria.

Result

A total of 23885 patients were available for the final analysis, and 2782 patients of whom had positive history of antipsychotics prescription. After adjusted for propensity score, antipsychotics were not associated with increased risk of culture-positive pneumonia (OR=0.80, 95% CI =0.66-0.98). Subgroup analysis among different age groups revealed that, antipsychotics exposure was associated with decreased risk of culture-positive pneumonia among younger adults aged less than 60 (OR 0.58, 95% CI 0.34-0.97) and 60 ≤ aged < 75 (OR 0.61, 95% CI 0.43-0.87), but not in elderly over 75 years old (OR 0.90, 95% CI 0.69-1.16).

Table 1.
Associations between antipsychotic medication use and infection in post-stroke patients.

	Before PSM			After PSM		
	Antipsychotics (-) (n=21103)	Antipsychotics (+) (n=2782)	OR (95% CI)	Antipsychotics (-) (n=2773)	Antipsychotics (+) (n= 2773)	OR (95% CI)
Infection	2024 (9.6)	438 (15.7)	1.00[a] (0.87-1.14)	440 (15.9)	437 (15.8)	0.99[e] (0.87-1.14)
Infection with culture positive						
Bacteremia	284 (1.3)	56 (2.0)	0·88[b] (0.65-1.20)	68 (2.5)	56 (2.0)	0·82[e] (0.58-1.17)
Pneumonia	889 (4.2)	179 (6.4)	**0·79[c] (0.65-0.96)**	218 (7.9)	178 (6.4)	**0·80[e] (0.66-0.98)**
Bacteriuria	805 (3.8)	229 (8.2)	1·13[d] (0.95-1.35)	220 (7.9)	229 (8.3)	1·04[e] (0.87-1.25)

[a] Adjusted for antipsychotics, age, surgery, mechanical ventilation, I-tube, CCI, hypertension, atrial fibrillation, opioid, anticholinergics, dopamine agonist, SSRIs, SNRIs, steroid, anti-acids, aspirin, clopidogrel
[b] Adjusted for antipsychotics, age, sex, surgery, mechanical ventilation, I-tube, CCI, opioid, anticholinergics, dopamine agonist, SSRIs, SNRIs, steroid, anti-acids, aspirin, clopidogrel
[c] Adjusted for antipsychotics, age, surgery, mechanical ventilation, I-tube, CCI, atrial fibrillation, opioid, anticholinergics, dopamine agonist, SSRIs, SNRIs, steroid, anti-acids, aspirin, clopidogrel
[d] Adjusted for antipsychotics, age, sex, surgery, mechanical ventilation, I-tube, CCI, hypertension, atrial fibrillation, opioid, benzodiazepines, anticholinergics, dopamine agonist, SSRIs, SNRIs, steroid, anti-acids, aspirin, clopidogrel
[e] Adjusted for propensity score

Bolded font indicating statistical significance. Abbreviations: CCI, Charlson comorbidity index; SSRI, selective serotonin reuptake inhibitor; SNRI, serotonin and norepinephrine reuptake inhibitor.

Table 2.
Associations between antipsychotics use and infection according to age in propensity score-matched cohorts

	Age	Antipsychotics (-)	Antipsychotics (+)	OR (95% CI)
Infection	18 ≤ age < 60 (n=1112)	85 (15.3)	84 (15.1)	0.99(0.72-1.35)
	60 ≤ age <75 (n=1736)	144 (16.6)	144 (16.6)	1.00(0.78-1.28)
	75 ≤ age (n=2702)	234 (17.3)	208 (15.4)	0.87(0.72-1.05)
Bacteremia	18 ≤ age < 60 (n=1112)	14 (2.5)	10 (1.8)	0.71(0.35-1.45)
	60 ≤ age <75 (n=1736)	17 (2.0)	19 (2.2)	1.12(0.60-2.10)
	75 ≤ age (n=2702)	41 (3.0)	27 (2.0)	0.65(0.40-1.06)
Pneumonia	18 ≤ age < 60 (n=1112)	37 (6.7)	22 (4.0)	**0.58(0.34-0.97)**
	60 ≤ age <75 (n=1736)	82 (9.4)	52 (6.0)	**0.61(0.43-0.87)**
	75 ≤ age (n=2702)	114 (8.4)	103 (7.6)	0.90(0.69-1.16)
Bacteriuria	18 ≤ age < 60 (n=1112)	27 (4.9)	34 (6.1)	1.28(0.79-2.06)
	60 ≤ age <75 (n=1736)	74 (8.5)	74 (8.5)	1.00(0.73-1.38)
	75 ≤ age (n=2702)	125 (9.3)	120 (8.9)	0.96(0.74-1.24)

Bolded font indicating statistical significance. Abbreviations: CCI, Charlson comorbidity index; SSRI, selective serotonin reuptake inhibitor; SNRI, serotonin and norepinephrine reuptake inhibitor.

Conclusion

Based on our results, antipsychotics did not significantly increase the risk of post-stroke infection, including bacteremia, pneumonia, and bacteriuria. Antipsychotics may be prescribed in post-stroke patients without increasing the risk of infection during the acute stroke period under the judicious judgement of the physician and when non-pharmacological options have failed.

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Funding: This work was supported by the Institute of Clinical Medicine Research of Bucheon St. Mary's Hospital , Research Fund, 2022 and by the National Research Foundation of Korea (NRF) grant funded by the Korean government (MSIT) , grant number, 2020R1F1A1065814