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AFRICAN AMERICANS AND APHASIA: A 25 YEAR REVIEW

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ABSTRACT

Aphasia is a devastating communication disorder that commonly occurs after stroke and reduces the quality of life of the stroke survivor. There is considerable concern that racial-ethic disparities in aphasia outcomes may exist with worse outcomes among African Americans that parallel worse general stroke outcomes. To date, there have been few attempts to organize and explore the aphasia literature to better understand the impact of aphasia in African Americans. Therefore, the objective of this review was to examine research in African Americans with aphasia over a 25 year period to organize the findings, further discussion, and stimulate research.

KEY WORDS: aphasia, African Americans, health equity

Introduction

Aphasia is a communication disorder that negatively impacts a stroke survivor's communication ability (language comprehension, language expression, reading, writing, attention, cognition) and frequently requires rehabilitative care (American Speech-Language-Hearing Association, 2017). The presence of aphasia is most commonly due to a stroke. The National Aphasia Association estimates the more than 2 million Americans are affected by the condition (National Aphasia Association, 2018). The most recent evidence suggests aphasia occurs in approximately 18% of all stroke survivors discharged from U.S. hospitals (Ellis, Hardy, Lindrooth, & Peach, 2017). Even in its mildest form, individuals with aphasia can experience social isolation and significant limitations in societal participation because of their communication deficits (Dalemans, DeWitte, Beurskens, Van Den Heuvel, & Wade, 2010; Mazaux et al., 2013).

Because aphasia is a condition that occurs after stroke and racial-ethnic differences exist in stroke-related outcomes, there is concern that race-ethnicity may be a key factor in the study of aphasia. For example, stroke is condition where African Americans are more likely to: a) experience a stroke at a younger age (Roth et al., 2011), b) die from stroke (Howard, 2013), c) and have greater levels of post-stroke disability (Ellis, Magwood, & White, 2017; Ellis, Boan, Turan, Ozark, Bachman, Lackland, 2015). Additionally, stroke is on the decline in the U.S. however decreases in stroke incidence does not exist among African Americans (Kleindorfer et al., 2010). Therefore, the study of racial-ethnic differences in post-stroke outcomes for conditions such as aphasia is critical to adequately understanding aphasia and the effects of the condition. To date, there has been little programmatic study of the condition in African Americans. Nor has there been systematic reviews to reconcile the literature related to aphasia in African Americans. Therefore, the objective of this paper was to present the findings of a systematic review of aphasia in African Americans covering the past 25 years.

Methods

The search strategy followed general PRISMA guidelines (Moher, Liberati, Tetzlaff, J., & Altman, 2009) to identify articles related to aphasia in African Americans. An electronic search for all relevant articles was conducted with PubMed/Medline and PsycINFO. The search was limited to aphasia in African Americans that met the following inclusion criteria: a) published in English language, b) African Americans with aphasia, and c) published between January 1993 and December 2017. A secondary search of the journal Aphasiology was completed because it is not Medline/PubMed or PsycINFO indexed but the study of aphasia is the predominate focus of the journal. A final search of Google & Google Scholar was completed to broaden the search in attempts to identify articles related to the topic of interest.

The search terms for this project included: "African Americans", OR "Blacks" AND "aphasia". A multi-step screening processed was conducted. First, search results were uploaded into EXCEL and duplicates were removed. The titles and abstracts were independently screened by the author. Abstracts with at least one "maybe" or "yes" were selected for full-text review. The author independently reviewed full articles for inclusion. Additionally, the author engaged in hand-searching through relevant journal searches and examination of bibliographies of included studies and review articles that emerged with the search strategy. After a review of full text articles, articles that did not meet inclusion criteria were excluded from the review. The search strategy is presented in Figure 1. Because of the heterogeneity of studies a meta-analysis was not performed, but instead to perform a qualitative analysis of the study findings.

Table 1. Rate of Aphasia – Studies including African Americans with aphasia and a comparison to a second racial-ethnic group.

Author(s)/Year	Sample	Outcomes	Findings
Mochari-Greenberger et al., 2015	Stroke sample=398,798 275,938 White 75,934 AA 31,546 Hispanic 13,172 Asian 2,208 Other	Presence of aphasia using NIHSS	Frequency of aphasia was significant different between racial/ethnic and sex groups. AA males more likely to have aphasia (OR=1.07) with white males as reference group. AA females have some likelihood of having aphasia as white females (OR=1.0) but higher likelihood than Hispanic, Asian and Other females.
Ellis et al., 2017a	21,280 White w/aphasia 4,333 AA w/aphasia 1,719 Hispanic w/aphasia	Presence of post-stroke aphasia	AAs age 19-44, 45-54, 55-64 at least two times more likely to have aphasia than Whites at the same age.

AA – African American; NIHSS – National Institutes of Health Stroke Scale

Results

Included studies

Sixty-one articles meeting inclusion criteria were identified through an initial search. Abstracts were reviewed for the inclusion criteria and 43 reports were excluded due to duplicate abstracts or absence of aphasia. Full-text articles were obtained for 17 articles of which two articles were excluded due to an absence of a clear measure of aphasia. Fifteen articles were included in this study. For consistency of reporting, the ethnic term African American was used for reporting the outcomes of studies utilizing the racial-ethnic term non-Hispanic Black (Blacks).

Characteristics of included studies

The fifteen studies included in this review consisted on two studies reporting racial-ethnic comparisons of aphasia incidence between African Americans and Whites, five studies that included aphasia clinical outcomes among a single group of African Americans, six studies that reported racial-ethnic comparisons of aphasia clinical outcomes between African Americans and Whites/Caucasians, and two studies reporting racial-ethnic comparisons of aphasia economic outcomes (length of stay and costs) between African Americans and Whites.

Racial-ethnic differences in rates of aphasia

Two studies quantified incidence of aphasia between African Americans and Whites. Mochari-Greenberger and colleagues (2015) reported the incidence of aphasia among 398,798 stroke survivors admitted to The Guidelines-Stroke hospitals from 2011-2014. They found that African Americans had the highest likelihood of having aphasia (OR=1.07) as measured by the NIH Stroke Scale (NIHSS) when compared to Whites and Hispanics. Ellis et al. also measured

rate of aphasia using Agency for Healthcare Quality Research and Quality (AHRQ) Healthcare Cost and Utilization Project (HCUP) data from eight states (OR, AZ, CO, FL, KY, NC, SC, AR) and found that the presence of aphasia overall was 18% of all discharged stroke patients but rates among individuals ages 19-44, 45-54, and 55-64 was higher among African Americans when compared to Whites. See Table 1 for data on racial-ethnic differences in rates of aphasia.

Aphasia Outcomes in African Americans - Studies of only African Americans

Five studies were completed to study the unique features of aphasia in African Americans. All studies were completed by Ulatowska and colleagues at the University of Texas at Dallas. Four of the five studies completed comparisons of African Americans with aphasia to non-neurologically impaired African Americans. The fifth study included 12 African Americans and was designed to measure the relationship between discourse and performance on the Western Aphasia Battery (WAB). Ulatowska and collegues found that a) ethnic repetition patterns were maintained among African Americans despite the presence of aphasia (Ulatowska et al., 2000), b) distinctive features of African American language remained present although to a lesser degree among individual with aphasia (Ultawowska et al., 2001a), c) African Americans with aphasia performed lower than African Americans without aphasia on standardized measures of aphasia but similar on picture description tasks (Ulatowska et al., 2001b), d) dialectical verb use was preserved in African Americans with mild-moderate forms of aphasia (Ulatowska & Olness, 2001) and e) there was a significant relationship between WAB aphasia quotient (AQ) and discourse measures among African Americans with aphasia (Ulatowska et al., 2003). However, in the final study ethnic features of African Americans was present in functional open-ended task but not fable retelling (Ulatowska et al., 2003). The collection of studies by Ulatowska and colleagues showed that many ethnic features of language are retained in African Americans with aphasia and discourse can offer a more robust method for exploring language-related issues in African Americans with aphasia. See Table 2 for studies of the impact of aphasia on ethnic features of the language of African Americans.

Racial-ethnic differences in aphasia clinical outcomes

Six studies reported potential racial-ethnic differences in aphasia clinical outcomes. Wertz, Auther, & Ross (1997) found that African Americans had lower scores on the Porch Index of Communicative Ability (PICA) gestural and graphic modality scores at 48 weeks post-onset, however both groups demonstrated the same amount and rate of improvement. Olness et al. (2002) found no significant differences between African Americans and Caucasians on several standardized batteries for aphasia. In contrast, Ellis & Peach (2016, 2017) found racial-ethnic differences in aphasia clinical outcomes using data from the AphasiaBank. The AphasiaBank, a database designed to offer aphasia researchers a large shared database of clinical and aphasia data (Forbes, Fromm, MacWhinney, 2012). In a study of 290 individuals with aphasia, AA's exhibited lower scores on the Boston Naming Test (BNT) when compared to Whites (4.8 vs 6.5; p=.000) (Ellis & Peach, 2016). Similarly, African Americans scores lower on the auditory comprehension (49.3 vs 53.3; p=.02) and verbal fluency (5.5 VS 7.6; P=.015) subtests of the WAB (Ellis & Peach, 2017). Two final studies (Olness et al., 2010 & Ulatowska et al., 2011) used more qualitative focused analyses and reported minimal differences between the two groups, however traditional statistical comparisons of outcomes were not completed

Racial-ethnic differences in aphasia economic outcomes (service utilization and costs of care)

Table 2. Aphasia Clinical Outcome – Studies including only African Americans with Aphasia.

Author(s)/Year	Sample	Outcomes	Findings
Ulatowska et al., 2000	36 AA w/aphasia 40 AA w/o aphasia	Use of repetition	Ethnic repetition patterns were maintained among AA w/aphasia despite mild language deficits
Ulatowska et al., 2001a	33 AA w/aphasia 30 AA w/o aphasia	WAB, TT, ASHA FACS, discourse assessment of personal narrative	AAs with aphasia performed lower than AA's w/o aphasia on WAB-AQ and cortical quotients, TT and ASHA FACS. Features of AA English were present in both groups. No significant differences between groups on measures of language quantity but high quality among AAs w/o aphasia.
Ulatowska et al., 2001b	36 AA w/aphasia 36 AA w/o aphasia	WAB, ASHA FACS, deriving lesson from fables and proverb interpretation	AAs with aphasia performed lower than AA's w/o aphasia on WAB, ASHA FACS, deriving lesion from fable and spontaneous interpretation of proverbs. No significant differences in picture description fable task or multiple choice proverb task.
Ulatowska & Olness 2001	36 AA w/aphasia 38 AA w/o aphasia	Verb use in narratives	Dialectical use of AAVE are preserved in mild –moderate forms of aphasia.
Ulatowska et al., 2003	12 AAs w/aphasia (moderate severity)	WAB, discourse evaluation (fable retell, narrative from picture description, personal narrative)	Significant relationship between WAB-AQ and discourse coherence quality ratings and reference. No ethnic features present during fable retelling. Discourse issues may be task specific. Ethnic features most present in functional open-ended tasks

AA – African American; WAB-AQ – Western Aphasia Battery Aphasia Quotient; TT – Token Test; ASHA FACS – ASHA Functional Assessment of Communication Skills for Adults; AAVE – African American Vernacular English

Table 3. Aphasia Clinical Outcome – Studies including African Americans with aphasia and a comparison to a second racial-ethnic group.

Author(s)/Year	Sample	Outcomes	Findings
Wertz et al., 1997	14 AA w/aphasia 37 Caucasians w/aphasia	PICA, TT	At 48 weeks post-onset of aphasia, AAs had lower PICA gestural and graphic modality scores. Overall groups demonstrated same amount and rate of improvement.
Olness et al., 2002	33 AA w/aphasia 30 AA w/o aphasia 29 Caucasians w/aphasia 32 Caucasians w/o aphasia	WAB, TT, ASHA FACS, discourse	No significant differences between AAs and Caucasians with aphasia on WAB AQ, TT, ASHA FACS. No significant differences were observed between the two groups on quantity measures of discourse.
Olness et al., 2010	12 AA w/aphasia 10 AA w/o aphasia 5 Caucasians w/aphasia 6 Caucasians w/o aphasia	WAB, discourse	No comparisons between racial-ethnic groups
Ulatowska et al., 2011	15 AA w/aphasia 18 Caucasians w/aphasia	Use of reported speech in narratives	Minimal differences in use of reported speech between the two groups
Ellis & Peach, 2016	29 AA w/aphasia 261 Whites w/aphasia	BNT	Lower mean scores among AAs (4.8) compared to Whites (6.5) after controlling for age, education, duration of aphasia and treatment duration
Ellis & Peach, 2017	29 AA w/aphasia 261 Whites w/aphasia	WAB	No significant differences between groups on total WAB-AQ. Lower scores among AAs on WAB-R word fluency and auditory comprehension substes

AA – African American; PICA – Porch Index of Communicative Ability; WAB – Western Aphasia Battery-Revised (WAB-R) Aphasia Quotient (AQ); TT – Token Test; ASHA FACS – ASHA Functional Assessment of Communication Skills for Adults; BNT – Boston Naming Test

Table 4. Service Utilization/Costs – Studies including African Americans with aphasia and a comparison to a second racial-ethnic group.

Author(s)/Year	Sample	Outcomes	Findings
Ellis et al., 2017b	1181 AAs w/aphasia 3150 White w/aphasia	Length of stay, cost of care	AAs w/aphasia experienced 2 day longer length of stay and ~$2800 greater cost of care compared to Whites.
Ellis et al., 2017c	1181 AAs w/aphasia 3150 White w/aphasia	Length of stay, SLP service utilization, SLP costs	AAs w/aphasia experienced 2 day longer hospital length of stay and were 5% more likely to use SLP services. AAs also received .57 more SLP visits at $61 greater cost.

AA – African American; SLP – speech language pathology

Two recent studies explored racial-ethnic differences in economic-related outcomes among individual with aphasia. In the first study, Ellis, Hardy & Lindrooth (2017) examined racial-ethnic differences in general healthcare utilization and cost of care among individuals with stroke-related aphasia in the state of North Carolina (NC). They found that African Americans experienced longer length of stays (+1.9 days) and at greater costs (+$2047) when compared to Whites. Longer length of stays and at greater costs persisted among African Americans even after controlling for stroke severity, illness severity, hospital characteristics, and unobserved hospital characteristics. In a follow study of speech language pathology (SLP) utilization and cost of care among individuals in the state of NC with stroke, Ellis, Peach, Hardy and Lindrooth (2017) found that African Americans with aphasia were: a) more likely to receive speech language pathology (SLP) services and b) received more SLP visits at greater costs even when compared to Whites even after controlling for stroke severity, illness severity, hospital characteristics, and unobserved hospital characteristics. These studies collective findings suggest in the state of NC, African Americans with aphasia experience longer length of stays, receive more SLP services and at a greater cost of care when compared to Whites with stroke in NC.

Discussion

Aphasia is a condition that occurs after stroke resulting in significant communication problems due to expressive and receptive language deficits. A twenty-five year review of literature suggests that a comprehensive agenda designed to explore aphasia in African Americans has yet to emerge. The lack of a specific agenda to examine this issue is a great concern because studies of aphasia and stroke (the primary cause of aphasia) continue to show that African Americans may be more susceptible to aphasia and in more severe forms (Ellis, 2009). Despite the limited number of studies identified in this review, several studies offer evidence of more severe aphasia impairment among African Americans when compared to Whites (Ellis & Peach, 2016; Ellis & Peach, 2017; Wertz, Auther, & Ross, 1997). These findings should not be a surprise because the general stroke literature has consistency shown that African Americans are more likely to experience a stroke (the primary cause of aphasia) (Benjamin et al., 2018) resulting in worse post-stroke outcomes (Centers for Disease Control, 2005; Ellis, Magwood, & White, 2017; Ellis,

Boan, Turan, Ozark, Bachman, Lackland, 2015) when compared to their White counterparts.

Overall however, this review shows minimal advancement in the understanding of aphasia in African Americans over the past 25 years. Studies by Ulatowska, Olness and colleagues provide a solid foundation for the study of aphasia in African Americans by showing the many distinctive features of communication among African Americans (e.g. African American Vernacular English, repetition patterns among African Americans) are maintained at least in mild to moderate forms of aphasia (Ulatowska et al., 2000); Ultawowska et al., 2001a; Ulatowska et al., 2001b; Ulatowska & Olness, 2001; Ulatowskat et al., 2003). Collectively these studies are grounded in the notion that single arm studies of a specific minority populations are critical to limiting ethnocentric bias that can occur and lead to diagnostic inaccuracy and ultimately mismanagement (Lucas et al., 2005). Yet until studies by Peach and Ellis (2016, 2017), little advancement has occurred in the study of this condition among African Americans.

There are at least two reasons why a programmatic study of aphasia in African Americans is urgently needed. First, reports from the Agency for Healthcare Research and Quality (AHRQ) consistently show worse health-related outcomes among African American and other racial-ethnic minority populations (AHRQ, 2016). The underlying causes of these disparities are unclear and not specifically tied to absence of health insurance a common explanation for racial-ethnic disparities in health-related outcomes. The National Healthcare Quality and Disparities Report suggests that differences in quality of services received is a contributor to disparities in health-related outcomes and an area of great concern. To date, it is unclear how these issues translate to racial-ethnic disparities in aphasia outcomes. It is notable that recent legislation in the form of the Patient Protection and Affordable Care Act (PPACA) was designed to improve access to insurance and subsequently access to quality healthcare (Patient Protection and Affordable Care Act, 2010). However, despite far more African Americans and other racial-ethnic minorities being insured with affordable health insurance, the likelihood of their having greater access to specialized care for conditions such as aphasia has yet to be established. Similarly, it is unclear if greater enrollment in insurance plans has translated into better quality of care for African Americans with aphasia.

Second, the findings of studies by Ellis and colleagues related to cost of care and speech-language pathology (SLP) service utilization offer an additional area of concern. Studies of general hospital care and SLP care showed: a) longer acute care length of stays, b) greater SLP service utilization and c) greater cost of care (hospital and SLP services) among African Americans with aphasia when compared to Whites. These findings are in contrast to studies of aphasia clinical outcomes which showed worse outcomes or greater levels of aphasia-related impairment among African Americans. These conflicting findings should lead clinicians and aphasiologists to ask how or why a racial-ethnic groups receiving greater specialized SLP care are exhibiting worse aphasia clinical outcomes. Obviously these studies of aphasia-related economic outcomes (length of stay, cost of care, service utilization) have been limited to the acute care setting and in a single state. However, they raise a number of questions for current investigators interested in aphasia research. For example, are the opposing findings of greater service utilization in acute care settings but worse long-term aphasia outcomes attributed to: a) differential patterns of care in other areas of the care continuum (inpatient rehab, outpatient rehab, home health, etc), b) differences in quality of care in acute care and other areas of the care continuum, or c) are there unique aspects of aphasia in African Americans that result in racial-ethnic differences in aphasia outcomes. A systematic and programmatic line of research is urgently needed to unravel and explain these issues related to African Americans and ultimately answering these questions will

improve outcomes in all individuals with aphasia regardless of their racial-ethnic background.

Conclusion

Despite being a high risk population for stroke, the primary underlying cause of aphasia, studies designed to explore the cause and implications of aphasia in African Americans have been slow to emerge. African Americans appear to be a higher risk for aphasia as well as stroke and more likely to have worse aphasia clinical outcomes when compared to Whites. Why comprehensive research agendas designed to study this condition in African Americans is unclear. However, the research opportunities are plentiful for the next generation of scholars whose interest lies in understanding aphasia and other neurologically based disorders of communication in this high risk racial-ethnic minority population.

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Figure 1. PRISMA Flow Diagram.