Outcomes from an intensive comprehensive aphasia program (ICAP): A retrospective look

Abstract

Intensive comprehensive aphasia programs (ICAPs) are increasingly sought-after by consumers. It is important to examine outcomes from this unique clinical service model to determine feasibility, effectiveness, and potentially, to determine profiles of patient recovery. This poster presents retrospective data from first time participants in one ICAP over a 5 year period. Findings demonstrate significant improvements on language and activity/participation measures from pre-treatment to post-treatment.

Background:
In recent years, there has been an increase in the number of intensive comprehensive aphasia programs (ICAPs) providing comprehensive speech-language therapy which targets impairment and activity/participation levels of language functioning (Rose, Cherney, & Worrall, 2013). Researchers are beginning to evaluate the outcomes from such programs (Persad, Wozniak, & Kostopoulos, 2013; Winans-Mitrik, Schumacher, Hula, Dickey, & Doyle, 2013). Outcome data from this unique service-delivery model are important to many stakeholders including the participants and their families, the clinicians, the organizations supporting the programs, and possibly in the future, third party payers.

ICAPs are grounded in two approaches described in the aphasia treatment literature: intensity of treatment which is derived from neuroplasticity literature and life participation which comes from the social model of rehabilitation. Many of the main principles from Kleim and Jones' article regarding neuroplasticity have been incorporated into treatment methodologies of ICAPs including: training to enhance specific brain functions, training to facilitate plasticity, repetition, intensity, salience, and transference (Kleim & Jones, 2008). Treatments based on life participation come from the social model and aim to impact a variety of factors that surround persons with aphasia and their activity/participation in the environment and with others (Byng & Duchan, 2005; Duchan, Linda, Garcia, Lyon, & Simmons-Mackie, 2001; Kagan, 1998; Kagan et al., 2008; 2001; Simmons-Mackie & Kagan, 2007; WHO, 2001).

The literature regarding the effectiveness of intensive therapy has been mixed. Robey's meta-analysis found positive results for more hours of aphasia treatment.(Robey, 1998). Bhogal et al also found that more hours of therapy over a shorter time led to greater improvements (Bhogal, Teasell, & Speechley, 2003). Code and colleagues found significant improvements after 1 month of intensive therapy in persons with chronic aphasia, with individual variation in the amount and type of recovery (Code, Torney, Gildea-Howardine, & Willmes, 2010). Another review, however, discussed the evidence and efficacy of intensive aphasia therapies and found inconsistent results, highlighting that there are complex interactions among participant variables, the types of treatments provided and the intensity of the treatment (Cherney, Patterson, & Raymer, 2011).

Traditional therapy typically provides 2-3 hours of individual therapy per week for a limited number of weeks. ICAPs provide a minimum of 1-2 hours of individual therapy a day, plus group sessions and computer lab experiences, totalling 5-6 hours of therapy per day for up to 5 weeks (Rose et al., 2013). Family and caregiver education is an integral part of ICAPs. Additionally, programs may hold daily staff meetings to plan treatments, and review patient progress. The program we are presenting data from provides 6 hours of therapy a day, 5 days a week for 4 weeks for a total of 120 hours of therapy over 4 weeks. Clinicians were trained to appropriately select, implement and modify a variety of different evidence-based treatments as needed based on participants' language deficits and progress made during the course of the program. The aim of this paper is to describe the outcomes from this particular ICAP. Our research question was: Do first time PWA participating in an ICAP show improvements on the following types of outcome measures:
- Impairment based measures
- Participation measures

        o   Patient-reported outcome measures

        o   Caregiver-reported outcome measures

Methods:

Participants: Between September 2008 and May 2013, there were 10 sessions with 95 participants. Twenty-nine persons repeated the program from 2-6 times. Institutional Review Board approval was obtained for retrospective data analysis before test scores were entered in the research database. Data from the 64 individuals who completed the program for the first time were included in this analysis. One individual with cognitive-communicative deficits did not complete testing and was removed. Tables 1 and 2 show demographic information and stroke characteristics for 63 participants. These participants were generally younger, white, well-educated, English-speaking males. While these participants appear different from the national picture of persons with aphasia, they were comparable to participants in other ICAP programs (Dickey et al., 2010; Ellis, Dismuke, & Edwards, 2010; Persad et al., 2013).

Procedure: All assessments were completed in three hour time blocks by the treating clinicians on the first day and during last week of each intensive program. The following pre- and post-tests scores were examined: Western Aphasia Battery Aphasia Quotient, Language Quotient, Cognitive Quotient (WAB AQ, LQ, CQ) (Shewan & Kertesz, 1980), Boston Naming Test (BNT) (Goodglass, Kaplan, Weintraub, & Segal, 2001), Communication Effectiveness Index for Person with Aphasia and Caregiver (CETI) (Lomas et al., 1989), American Speech-Language-Hearing Association – Quality of Communication Life (ASHA-QCL) (Paul et al., 2005), and the Communication Confidence Scale for Aphasia (CCRSA) (Cherney, Babbitt, Semik, & Heinemann, 2011).

Results:

Paired t-test statistics indicate that there are significant improvements between pre-post testing for the language measures and the activity/participation questionnaires (see Tables 3 and 4). For language measures, mean WAB-AQ, LQ, CQ and BNT scores all improved with significance of $p > .00001$. Activity and participation measures also improved with significance of $p > .0001$. The difference between the pre and post WAB AQ score is 7 and the CETI Caregiver is 11. These improvements may also indicate clinically significant change (Katz & Wertz, 1997; Lomas et al., 1989). Additional statistical analyses will examine the effects of age, severity and time post-onset on the gains seen in the data from this ICAP.

Discussion:

It is a challenge to evaluate outcomes from ICAPs due to the heterogeneity of the participants. Varadhan et al discuss the importance of broadening the understanding of effectiveness of treatments administered in heterogeneous clinic populations (Varadhan, Segal, Boyd, Wu, & Weiss, 2013). Therefore, a starting place is to retrospectively examine clinical data. Our ICAP data show that participating in an intensive aphasia program can have significant effects on language and participation measures. Retrospective analysis from other ICAPs have reported similar results in improvements (Code et al., 2010; Persad et al., 2013; Rodriguez et al., 2013; Winans-Mitrik et al., 2013). This particular phase of analysis could be considered a precursor to a phase I/II trial as it is describing the outcomes from an ICAP without the control of clinical trials.

There are limitations in this study which constitute constraints typical of clinically-based research. Due to the timing of our program and location of participants, we were unable to obtain multiple pre-treatment baselines or post-treatment maintenance data. It is also possible that clinician bias was a factor in the evaluation outcomes as clinicians may have felt pressure due to expectations for significant recovery following participating in such a program.

While these data demonstrate significant improvement in persons with aphasia who participate in an ICAP are encouraging, more research is needed about the factors that contribute to that gain. Further investigation of factors such as participant motivation, clinician training and expertise, type of evidence-based treatments provided, or specifically if the intensity of the treatment is warranted. Future research should also consider the impact of repeated participation in an ICAP and examine outcomes for returning participants. Additionally, more research is needed regarding what level of improvement demonstrates clinically significant change.

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Table 1. Demographic information for 63 first-time ICAP participants

Sex	Race /Ethnicity	Age	Native Lang	Education	Handed
M= 49 (78%) F= 14 (22%)	Caucasian= 60 African Amer.= 2 Asian= 1 Hispanic = 2	Avg=53 (SD=17) Range 18-86	English= 59 Spanish= 2 Hebrew= 1 Danish= 1	Advanced deg= 28 4 yr deg= 13 Some college= 18 HS diploma= 3 9-11th grade= 2	R= 58 L= 5

Table 2. Stroke characteristics for 63 first-time ICAP participants

Months Post-Onset	Etiology	Aphasia Type	Motor Speech	WAB AQ score
Avg=15 (SD=15) Range = 3-87	LHemi CVA= 53 TBI= 2 Infectious Dis= 2 Tumor= 1 TBI/CVA= 3 Other/Unknown= 2	Non-fluent= 45 Fluent= 18	Apraxia= 39 Dysarthria= 2 Both= 2	Avg= 49 (SD=24) Range = 7-91.4

Table 3. Language Measure Mean Scores from Pre-treatment to Post-treatment

Language Measures	WAB AQ	WAB LQ	WAB CQ	BNT
n=	63	54	36	56
Mean Pre Mean Post	48.8 (SD=24) 55.8 (SD=23)	53.1 (SD=18) 59.6 (SD=19)	59.3 (SD=18) 65.8 (SD=18)	16.9 (SD=20) 21.0 (SD=21)
Difference	+7.0	+6.5	+6.5	+4.1
t(df)=	8.4 (62)	12.7 (53)	11.1 (35)	5.7 (55)
P value	<.00001*	<.00001*	<.00001*	<.00001*
% change	12.5%	10.9%	9.9%	19.5%

Table 4. Activity/Participation Measure Mean Scores from Pre-treatment to Post-treatment

Participation Measures	CETI PWA	CETI Caregiver	ASHA-QCL	CCRSA
n=	59	54	59	55
Mean Pre Mean Post	54.5 (SD=19) 63.5 (SD=18)	46.6 (SD=16) 58.0 (SD=16)	3.5 (SD=.6) 3.8 (SD=.7)	26.9 (SD=6.2) 29.9 (SD=5.8)
Difference	+9	+11.4	+0.3	+3
t(df)=	5.7 (58)	10.2 (53)	4.4 (58)	5.5(54)
P value	<.00001*	<.00001*	<.0001*	<.00001*
% change	14.2%	19.7%	7.9%	10%