



Volume 2, Number 2
July 2015

ISSN 1117-4153



THE TROPICAL JOURNAL OF HEALTH SCIENCES

Published By

**COLLEGE OF HEALTH SCIENCES,
UNIVERSITY OF ILORIN**

(A WHO Collaborating Centre for Research and Manpower Development)

Available on African Journal Online (AJOL)

Volume 22, Number 2
July, 2015

ISSN 1117-4153

THE TROPICAL JOURNAL
OF
HEALTH SCIENCES

PUBLISHED

BY

COLLEGE OF HEALTH SCIENCES
UNIVERSITY OF ILORIN, ILORIN, NIGERIA

(A WHO Collaborating Centre for Research and Manpower Development)
Also available on AFRICAN JOURNAL ONLINE (AJOL)

THE TROPICAL JOURNAL OF HEALTH SCIENCES

Official Publication of the College of Health Sciences, University of Ilorin

EDITORIAL BOARD

EDITOR-IN-CHIEF

A.B. Okesina

ASSOCIATE EDITORS

E.O. Olorundare

T.O. Odebode

O.T. Adedoyin

BUSINESS/CIRCULATION MANAGER

T.M. Akande

CONSULTING EDITORS

O.K. Alausa NIGERIA

V. Neufeld CANADA

E.B. Attah NIGERIA

E.H.O. Parry UNITED KINGDOM

J.D. Hamilton AUSTRALIA

H.G. Schmidt GERMANY

D.R. Hopkins UNITED STATES

O.Sofola NIGERIA

O.O. Kale NIGERIA

J.Weisfeld EGYPT

AIMS AND SCOPE

The Tropical Journal Of Health Sciences (TJHS) is an international journal which provide a forum for exchange of ideas to those engaged in the Health Science and related fields. The journal intends to publish high quality papers on original research, case reports, short communications, commentary, review articles, editorials, correspondence and book reviews. TJHS is an official organ of the College of Health Science (A WHO Collaborating center for Research and Manpower Development), University of Ilorin, Ilorin, Nigeria and will also serve as a medium for disseminating information on the activities of the college

Editorial notices

The journal will be published biannually with two issues making one volume. TJHS invites manuscripts from the Health Sciences and related disciplines. Subscription per journal issue: Faculty staff (=N=500.00); student (=N=350.00); private individuals (=N=750.00); Institution/Libraries (=N=950.00); Overseas subscription (\$ 15.00 or equivalent).

Editorial and all other correspondence should be sent to:

The editor-in-Chief,
The tropical journal of Health Sciences,
% Office of the Provost,
College of Health Sciences,
University of Ilorin,
P.M.B. 1515,
Ilorin,
Nigeria.

Tel: (031) 221844
Fax: (031) 222749

E-mail: tjhs_ilorin@yahoo.com

All Rights Reserved

No part of this journal may be reproduced, stored in a retrieval system or transmitted in any form or by any means electronic, mechanical, photocopying, recording or otherwise without permission of the publisher.

The Tropical Journal of Health Sciences

ISSN 1117-4153

THE TROPICAL JOURNAL OF HEALTH SCIENCES

Volume 22 Number 2 July, 2015

Editorial comments_____v

Research papers

Pregnancy Outcomes Following Assisted Reproduction Technologies For Infertile Women
At A Public Health Institution In Nigeria.

L.O.Omokanye, A,W.O.Olatinwo, K.A.Durowade, S.A.Bilaminu, A.G.Salaudeen, A.A.Panti_____ 1

Antibody To Hepatitis C Virus Among Children In Benin City, Southern Nigeria

Ayebo ES, Wilson ES_____ 7

Antinociceptive And Antipyretic Properties Of Tapinanthus Dodoneifolius Leaf Extract
In Albino Rats

Imam-Fulani AO, Baba MA, Owoyele BV_____12

Role of Routine Preoperative Laboratory Testing in Patients Undergoing Elective, Low-Risk Day
Case Surgery

Idris OL, Kolawole OA, Adejumobi MO, Adedeji OA_____16

Broken Dental Needle During Administration of Inferior Alveolar Nerve Block: a Case Report and
Review of Literature

Adeyemi MF, Ibraheem GH, Ernest MA, Adeyemo WL, Ernest SK_____ 19

EDITORIAL COMMENTS

Pregnancy Outcomes Following Assisted Reproduction Technologies For Infertile Women At A Public Health Institution In Nigeria.

¹L.O.Omokanye, ¹A.W.O.Olatinwo, ²K.A.Durowade, ³S.A.Bilaminu, ⁴A.G.Salaudeen, ⁵A.A.Panti

¹Department of Obstetrics and Gynaecology, College of Health Sciences, University of Ilorin, Ilorin; Nigeria. ²Department of Community Medicine, Federal Medical Centre, Ido-Ekiti, Nigeria. ³Department of Chemical Pathology and Immunology, College of Health Sciences, University of Ilorin, Ilorin; Nigeria. ⁴Department of Epidemiology and Community Health, College of Health Sciences, University of Ilorin, Ilorin; Nigeria. ⁵Department of Obstetrics and Gynaecology, Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria.

Abstract:

Infertility is a cause of marital problems, particularly in resource limited countries where it accounts for over 60% of gynaecological consultations. Of the various treatment options available for the treatment of infertility, none of the treatment procedures have had an impact on the society as much as Assisted Reproduction Technologies.

The study aimed to determine pregnancy outcome assisted conception.

Thirty seven (37) clients who underwent the procedure of ART between 1st January 2012 and 31st December 2013 at the Assisted Reproduction Technology (ART) unit of University of Ilorin Teaching Hospital, Ilorin, Nigeria.

A total of 132 patients who had infertility consultation at the ART clinic, 37 (28%) underwent successful ART procedures. The patients aged 28-52 years with a mean age of 38.7 ± 6.7 year. Nine (24.3%) had primary infertility while 28 (75.7%) had secondary infertility. Their duration of infertility ranged from 1 to 13 years (10.1 ± 6.9 years). Majority (78.4%) had conventional in vitro fertilization while eight (21.6%) had intracytoplasmic sperm injection. Only three (8.1%) cases of cycle cancellation were recorded. Eight clinical pregnancies were recorded from the remaining 34 clients giving a cumulative pregnancy rate of 23.5%. However 4(50%) resulted in early first trimester miscarriage and of the remaining four pregnancies, one woman successfully delivered, giving a live birth rate of 25%, while others are on-going. Pregnancy outcome was not significantly affected by age of the woman, duration of infertility, gender infertility factors and serum prolactin level ($p > 0.01$).

The prospect of ART looks good in public hospitals in developing countries. However, Public-Private Partnership (PPP), availability of dedicated personnel; promoting subsidy on IVF drugs and consumables/encouraging indigenous production among others will help in achieving its domestication in Nigeria.

Keywords: Assisted Reproduction Technology, in vitro fertilization, Nigeria.

Introduction

One of the most precious gifts a family can enjoy is the ability to bring new life into the world. However, the desire to have children and the disappointment of not being able to conceive can be extremely devastating to a couple. Over the past twenty years, fertility problems have increased dramatically. At least 25 percent of couples planning to have a baby have trouble conceiving (1 in 10 couples)¹. The good news is that current medical technology continues to improve the chances of more couples being able to conceive children through assisted reproductive technologies such as In vitro fertilization. For instance, infertile couples where women have blocked or absent fallopian tubes, or where men have low sperm counts. In vitro fertilization offers a chance at parenthood to couples, who until recently would have had no hope of having a "biologically related" child.

Worldwide infertility is generally quoted as occurring in 8-12% of all couples¹. Infertility rates among married couples in African countries range from 15% to 30%². Experiences from clinical practice indicate that infertility is a major burden on clinical service delivery in Nigeria. Several reports indicate that infertility is the most frequent reason for gynecological consultation in Nigeria^{2,3,4}. More than 50% of gynecological caseloads are as a result of infertility consultations and over 80% of laparoscopic investigations are for management of infertility^{2,3}. About 30% of infertility is due to female problems, 30% to male problems, and 30% to combined male/female problems while in 10% there is no recognizable cause¹. Recent data show that the male factor as a cause of infertility is present in 40-50% of cases⁵.

Correspondence to:

Dr. Omokanye LO

Consultant Obstetrician and Gynaecologist,
Department of Obstetrics and Gynaecology,
College of Health Sciences,
University of Ilorin.

Email address; omostuff1111@yahoo.com.

Phone no: +2348033630497.

Experience in infertility management at the University of Benin Teaching Hospital (UBTH) in over two decades has defined the content and context of an effective and efficacious infertility treatment. About 60% of the 5000 consecutive couples assessed in a twenty years period did not achieve pregnancy with the conventional infertility. Therefore conventional infertility treatment method is an insufficient capacity to treat the majority of the infertile couple encountered in our environment⁴. The only way to improve pregnancy outcome was to acquire competence for Assisted Reproduction technology. The objective of this observational study was to determine the bio-social characteristics and pregnancy outcomes among patients who underwent ART procedures in our centre.

Materials and Methods

Setting

This is a prospective observational study of patients who underwent ART procedures at the ART unit of the department of Obstetrics and Gynaecology, University of Ilorin Teaching Hospital, Ilorin, Nigeria from 1st January 2012 to 31st December 2013.

Methods

Information on biosocial data and other general information of the patients were documented at presentation. Investigation results i.e. transvaginal/saline infusion sonography, hormonal profile and/or laparoendoscopic findings were noted. All women had a Body Mass Index (BMI) (calculated as weight in kilograms divided by the square of height in meters) ranging between 18 and 30. Seminal Fluid Analysis was conducted for male partners. The criteria for men were a sperm count of at least 20 million cells per milliliter of semen and progressive sperm motility of 50% or greater. Male partners with semen count and/or motility less than the cut-off values were offered Intracytoplasmic Sperm Injection (ICSI) unless the sperm count was zero after centrifugation; therefore donor sperm was used for in vitro fertilization. All clients consented to treatment before its commencement.

The treatment cycles was carried out in four batches. Clients' menstrual cycle was synchronized using Oral Contraceptive Pills (OCP) and Controlled Ovarian Stimulation (COS) was then carried out using the long protocol. Pituitary down regulation was achieved by daily subcutaneous injection of 0.5mg of buserelin (Suprefact; Aventis Pharm, West Malling, UK) starting on day 21 of a synchronized menstrual cycle for 12 to 14 days⁶. Assessment of adequate pituitary down regulation was then carried out subjectively using antral follicular count (few or no follicle in the ovaries), onset of menstruation and/ or endometrial thickness of less than 5mm on Transvaginal

Ultrasonography⁶.

With onset of menstruation the dose of buserelin was reduced to 0.25mg on day 3 and COS was effected using daily intramuscular injections of 225IU (3 vials) of highly purified human menopausal gonadotrophin (Menopur; Ferring Pharmaceuticals, Kiel, Germany) in either stepdown or step up fashion against follicular growth. Also, precervical assessment (trial transfer) was carried out on day 2/3 of menses.

COS was assessed by serial monitoring of follicular size and endometrial thickness with transvaginal ultrasound. When the leading follicle reaches a diameter of 18mm or more usually around day 12th, 13th or 14th day of COS, intra muscular injections of 10,000IU of human chorionic gonadotropin (hCG) (Pregnyl; NV Organon, Oss, the Netherlands) was administered for final follicular maturation; followed by oocyte retrieval 34-37hours after hCG administration under transvaginal ultrasound guidance with the aid of Paracervical block⁷. An excessive ovarian response was defined as 15 or more follicles 11 to 14mm in diameter by day 10, 11 and 12 of COS, while a failed response was defined as no follicles after 10 days of COS, as the need to continue COS beyond 20days⁸.

The numbers of follicles aspirated and oocytes retrieved were carefully recorded by the embryologist. After 3 to 6 hours of incubation oocytes were inseminated in a petri dish for conventional IVF using 50,000 to 10,000 potentiated sperm per oocyte and then returned to the incubator. For ICSI cycles, the mature oocytes were injected with a single immobilized spermatozoon after removal of cumulus complex; and they were examined for fertilization after 16 hours of incubation⁹.

Assessments of embryos quality were conducted using Niu et al criteria¹⁰. Only the highest quality embryos were selected for transfer by the author 72hours after retrieval. Embryo transfer was done with a flexible Edwards-Wallace catheter (Simcare, Lancing, UK)¹¹ aided by abdominal ultrasound as described by Gracia-Velasco et al¹². Luteal phase progesterone supplementation was achieved using twice daily doses of 800mg intravaginal micronized progesterone pessaries (Cyclogest; Cox, Brarnstaple, UK) stating from the day of oocyte retrieval.

Results

Among 132 infertile women who attended ART unit during the study period, 37(28%) had successful ART procedures in four batches. The patients aged 28-52 years with a mean age of 38.7 ± 6.7 years. Twenty seven (73%) out of thirty seven were nulliparous and

Table 1: Socio-demographic characteristics of the clients

Variables	Frequency	Percentage (%)	N=37
Age Wife (years)			
25-34	12	32.4	
35-44	18	48.6	
45-54	7	19.0	
Range=28-52 years		Mean=38.7±6.7 years	
Parity			
0	27	73.0	
1	6	16.2	
2	3	8.1	
3	1	2.7	
Range= 0-3		Mean=0.41±0.76	
Age Husband (years)			
30-39	10	27.0	
40-49	17	46.0	
50-59	9	24.3	
≥60	1	2.7	
Range=31-62 years		Mean=44.5±7.6 years	
Social Class			
High	2	5.4	
Low	15	40.5	
Middle	20	54.1	
Type of Infertility			
Primary	9	24.3	
Secondary	28	75.7	
Duration of Infertility (years)			
1-10	25	67.6	
11-20	9	24.3	
>20	3	8.1	
Range- 1-33 years		Mean=10.1±6.9	

more than half (54%) belong to middle social class. Nine (24.3%) had primary infertility while 28 (75.7%) had secondary infertility. The mean age of their husband was 44.5 ± 6.7 years (range 31-62years). Their duration of infertility ranged from 1 to 33 years (10.1 ± 6.9 years). (Table 1).

Table 2 showed gender infertility factors, investigation results and interventions before ART procedures. Male alone factor and female alone factors accounted for 5 (14%) and 12 (32%) of cases respectively. Sixteen (43%) had bilateral patent tubes while only one patient (2.7%) with unilateral patent tube. More than half (54%) had bilateral blocked tubes. Less than half (46%) of their spouse had normozoospermia; followed by 10 (27%) with oligospermia and 2 (5.4%) each with oligoasthenozoospermia and asthenospermia respectively. More than half (56.8%) of the patients had normogonadotrophic normogonadism while 5 (13.5%) had hyperprolactinaemia. Most 21 (56.8%) had no surgical interventions before ART. Majority (78.4%) had conventional in vitro fertilization while eight (21.6%) had intracytoplasmic sperm injection.

Table 3 showed pregnancy outcomes following ART procedures. The mean numbers of oocytes retrieved

Table 2: Gender Infertility Factors And Investigation Results. Gender infertility/Tubal factors/Semen Analysis/Hormonal profile/interventions/Procedure

Variables	Frequency	Percentage (%)	N=37
Gender-Infertility factor			
Male factor	5	14.0	
Female factor	12	32.0	
Male/Female factor	17	46.0	
Unexplained	3	8.0	
Tubal factors			
Bilateral patent tube	16	43.0	
Bilateral Hydrosalpinx	2	5.4	
Bilateral Tubal blockage	18	48.6	
Unilateral Tubal blockage	1	2.7	
Sperm counts			
Normospermia	17	46.0	
Oligospermia	10	27.0	
Azoospermia	4	10.8	
Oligo-asthenospermia	2	5.4	
Asthenospermia	2	5.4	
Severe oligospermia	1	2.7	
Oligoteratosperm	1	2.7	
Hormonal profile			
Hypergonadism	14	37.8	
Hypogonadism	2	5.4	
Normogonadism	21	56.8	
Prolactin			
Normoprolactinaemia	32	86.5	
Hyperprolactinaemia	5	13.5	
Interventions before ART			
None	21	56.8	
Hystero-adhesiolysis	2	5.4	
Lap-cystectomy	1	2.7	
Open Myomectomy	9	24.3	
Lap-Ovarian drilling	2	5.4	
Lap-Tubal disconnection	2	5.4	
ART Procedure			
ICSI	8	21.6	
IVF	29	78.4	

Table 3: Pregnancy outcomes following ART procedures

Variable	Frequency	Percentage (%)	N=37
Cycle cancellation			
Yes	3	8.1	
No	34	91.9	
Oocyte Retrieved			
1-5	29	78.4	
6-10	6	21.2	
>10	2	5.4	
Range- 1-16		Mean=4.84±3.2	
Number fertilized			
0	3	8.1	
1-5	29	78.4	
>5	5	13.5	
Range-0-9		Mean=3.14±2.0	
Embryo transferred			
0	6	21.2	
1-5	29	78.4	
>5	2	5.4	
Range-0-6		Mean=2.3±1.8	
Outcome (34)			
None	26	76.5	
Pregnancy	8	23.5	
Miscarriages n=8			
Yes	4	50.0	
No	4	50.0	

Table 4: Socio-economic/reproductive variables and Pregnancy outcomes

Age of wife (Years) value	Pregnancy outcome		χ^2	df	OR	95%CI	Fisher's p
	Yes (%)	No(%)					
25-34	3(25.0)	9(75.0)	1.01	1	2.44	0.31-19.85	0.366*
=35	3(12.0)	22(88.0)					
Husband Age							
(yrs)							
<60	5(13.9)	31(86.1)	5.31	1	0.00	0.00-0.39	0.162*
=60	1(100.0)	0(0.0)					
Social Class							
High	1(100.0)	0(0.0)	5.14	1	-	-	0.167*
Low/Middle	5(16.7)	30(83.3)					
Infertility							
duration							
(yrs)							
<20	5(15.6)	27(84.4)	0.06	1	0.74	0.05-21.25	1.000*
=20	1(20.0)	4(80.0)					
Male factor							
Yes	2(40.0)	3(60.0)	2.41	1	4.67	0.39-57.71	0.177*
No	4(12.5)	28(87.5)					
Female							
Yes	3(25.0)	9(75.0)	1.01	1	2.44	0.31-19.85	0.367*
No	3(12.0)	22(88.0)					
Male/Female							
Factor							
Yes	1(5.9)	16(94.1)	2.47	1	0.19	0.0-0.25	0.189*
No	5(25.0)	15(75.0)					
Prolactin							
Normal	6(18.8)	26(81.2)	1.12	1	1.12	- -	0.566*
Abnormal	0(0.0)	5(100.0)					
Tubal factor							
Normal	3(18.8)	13(81.2)	0.13	1	0.18	0.18-0.71	1.000*
Abnormal	3(16.7)	18(83.3)					

was 4.8 ± 3.2 , oocyte fertilized 3.1 ± 2.0 and maximum number of embryos transferred per woman was 3. Only three (8.1%) cases of cycle cancellation were recorded. Eight pregnancies were recorded from the remaining 34 patients giving a cumulative pregnancy rate of 23.5% and 4(50%) resulted in early first trimester miscarriage. Of the remaining four pregnancies, one of the patients had successfully delivered, giving a live birth rate of 25%, while others are on-going. Pregnancy outcome was not significantly affected by age of the woman, duration of infertility, gender infertility factors and serum prolactin level ($p > 0.01$). (Table 4)

Discussion

The first pregnancy after fertilization of a human egg in vitro and the first from an in vitro-fertilized embryo were reported in 1976 and 1978^{13, 14}. Since then more than four million pregnancies have been achieved worldwide by IVF and its modifications. As experience has accumulated, success rates have increased, and indications for these procedures have expanded, ART now accounts for 1-3 percent of live birth in United State and Europe.

In Nigeria, Oladapo Ashiru pioneered the IVF program in 1984 and his team successfully delivered the first IVF baby in 1986¹⁵. Since then many IVF centres have

sprung up in the country majorly private owned due to enormous cost for the purchase of equipment and training of staff. In recent time, few public hospitals have commenced IVF program with collaborative efforts of international agencies through a long-term institutional development grant (LID)¹⁶. However, this was not the case in our centre.

The UITH ART unit is a one-stop centre with the state of the art facilities operates through revolving fund scheme on cost recovery basis. All the unit members have acquired intensive hands-on training including the lead author at several IVF centres in India prior to commencement of activities in 2011. The centre still relies on freelance embryologist pending the time the resident embryologist are proficient enough to handle the procedure. It has also acquired collaboration with many international and national institutions in the field of reproductive medicine: namely; Apollo Hospital, Chennai, Chennai Fertility Centre; India and University of Benin Teaching Hospital (UBTH), Nigeria.

The cost of IVF/ICSI in our centre ranges between 2,800 to 3,000 dollars because the unit has commenced low-cost stimulations protocol with the aid of clomiphene citrate and few ample of highly purified human menopausal gonadotrophin (Menopur; Ferring Pharmaceuticals, Kiel, Germany) for COS. This figure is at par with UBTH, Nigeria probably because it is a public hospital like ours who's pricing is not profit making¹⁶. On the contrary it is far cheaper compared to most private owned centres in Nigeria¹⁷, other African countries^{18,19} and Europe^{19,20}.

Although the cost of IVF in our unit appears to be the lowest in the world, the cumulative pregnancy, and clinical pregnancy and take home pregnancy rates of 23.5%, 50% and 25% respectively are comparable to the rates in other standard hospital in the world^{8,11,16}

though the sample size of the index study is very small. Also, the findings of insignificant associations between clients' age, duration of infertility and pregnancy outcomes appears contrary to results of previous studies,^{21, 22} however, it may be attributed to the limited sample size in this study.

Despite the low-cost of IVF in our centre, majority of our clients could not afford the treatment and those that had experienced failed 1st attempt hardly come back for 2nd attempt. This is not surprising because the centre operates in Nigeria; a third-world country where over 60% of the populace live below a dollar per day. This is similar to findings at UBTH in the same country though at different geographical zones.¹⁶ Considering this the UITH management has set aside

limited fund to assist the indigent clients with limited coverage considering the numbers of infertile couples that required the services. Thus the need for prompt intervention of government and non-governmental organization (NGOs) to support the clients.

In conclusion, this study has demonstrated the feasibility of IVF/ICSI in low-resource setting like ours. The need for intervention of government and non-governmental organization and availability of drugs/consumables possibly through removal of subsidy on importation and or encouraging indigenous production coupled with provision of grants to trained personnel and on the whole implementation of Millennium Development Goal 1 (MDG1)²³ will further assist in the domestication of this technology in the country.

References

1. Inhorn MC. Global infertility and the globalization of new reproductive technologies: illustrations from Egypt. *Soc Sci Med.* 2003; 56(9):1837-51.
2. Umeora OU, Mbazor JO, Okpere EE. Tubal factor infertility in Benin City, Nigeria - sociodemographics of patients and aetiopathogenic factors. *Trop Doct.* 2007; 37(2):92-4.
3. Otubu JA, Sagay AS, Dauda S. Hysterosalpingography, laparoscopy and hysteroscopy in the assessment of the infertile Nigeria female. *East Afr Med J* 1990; 67:370-2.
4. Orhue A, Aziken M. Experience with a comprehensive university hospital-based infertility program in Nigeria. *Int J Gynaecol Obstet* 2008; 101:11-5.
5. Owolabi AT, Fasubaa OB, Ogunniyi SO. Semen quality of male partners of infertile couples in Ile-Ife, Nigeria. *Niger J Clin Pract* 2013; 16:37-40
6. Popovic-Todorovic B, Loft A, Lindhard A, Bangsbo S, Anderson AM, Anderson AN. A prospective study of predictive factors of ovarian response in 'standard' IVF/ICSI patients treated with recombinant FSH. A suggestion for a recombinant FSH dosage normogram. *Human Repro* 2003; 18 (4): 781-7.
7. Selman HA, De Santo M, Sterzik K, Coccia E, El-Danasouri I. Effect of highly purified urinary follicle-stimulating hormone on oocyte and embryo quality. *Fertil Steril* 2002; 78 (5): 1061-7.
8. European, Israel Study on Highly Purified Menotropin versus Recombinant follicle stimulating hormone in IVF/ICSI cycles; a randomized, comparative trial. *Fertil Steril* 2002; 78 (3): 520-8

9. Baker VL, Fujimoto VY, Kettel LM, Adamson GD, Hoehler F, Jones CE et al. Clinical efficacy of highly purified urinary FSH versus recombinant FSH in volunteers undergoing controlled ovarian stimulation for in vitro fertilization: a random multicenter, investigator-blind trial. *Fertil Steril* 2009; 91(4): 105-11.
10. Nui Z, Feng Y, Zhang A, Sun Y, Zhang H. Progesterone levels on oocyte retrieval day can predict the quality of viable embryos but not pregnancy outcome on intracytoplasmic sperm injection. *Gynecol Endocrinol* 2008; 24 (8): 452-8.
11. Pacchiarotti A, Aragona C, Gaglione R, Selman H. Efficacy of a Combined protocol of urinary and recombinant follicle-stimulating hormone used for ovarian stimulation of patients undergoing ICSI cycle. *J Assist Reprod Gene* 2007; 24 (9): 400-5.
12. Garcia-Velasco JA, Isaza V, Martinez-Salazar J, Landazabal A, Requena A, Remohi J et al. Transabdominal ultrasound-guided embryo transfer does not increase pregnancy rates in oocyte recipients. *Fertil Steril* 2002; 78 (3): 534-9.
13. Steptoe PC, Edwards RG. Reimplantation of a human embryo with subsequent tubal pregnancy. *Lancet* 1976; 1:880
14. Steptoe PC, Edwards RG. Birth after the reimplantation of a human embryo. *Lancet* 1978; 2:366.
15. Okwelogu IS, Azuike EC, Ikechebelu JI, Nnebue CKC. In vitro Fertilization Practice: Awareness and Perception among Women attending Fertility Clinics in Okija, Anambra State; Nigeria. 2012; 3 (2): 5-10.
16. Augustine AO, Michael A, Abieyuwa PO, Kennedy OI, Gabriel O. In vitro fertilization at a public hospital in Nigeria. *Int J Gynaecol Obstet*. 2010; 118 (1): 56-60.
17. Okohue JE, Onuh SO, Ikimalo JI, Wada I. Patients' preference for number of embryo transferred during IVF/ICSI: a Nigerian Experience. *Niger J Clin Pract* 2010; 13 (3): 294-7.
18. Platteau P, Desmet B, Odoma G, Albano C, Devroey P, Tamale Sali E. Four years of IVF/ICSI experience in Kampala (Uganda). *ESHRE Monogr* 2008; 1: 90-2
19. Horbst V, Male perspectives on infertility and assisted reproductive technologies (ART) in sub-Saharan contexts. *Facts Views Vision ObGyn* 2010;2(3): 22-7
20. American Society for Reproductive Medicine. Frequently asked questions about infertility. <http://www.asrm.org/patients/faqs.html>. Accessed August 29, 2014
21. JunHao Yan, KeLiang Wu, Rong Tang, LingLing Ding, Zi-Jiang Chen. Effect of maternal age on the outcomes of in vitro fertilization and embryo transfer (IVF-ET). *Sci China Life Sci*. 2012; 55: 694-8.
22. Bhattacharyya S, Masheshwari A, Mollison J. Factors associated with failed treatment: an analysis of 121,744 women embarking on their first IVF cycles. *PLoS ONE*. 2013; 8(12):e82249.doi:10.1371/journal.
23. Jan W, David O." Addressing UN Millenium Development Goals". *Field Actions Science Reports*. <http://factsreports.revues.org/611>. Accessed 30 August 2014.

Antibody To Hepatitis C Virus Among Children In Benin City, Southern Nigeria

Ayebo ES, Wilson ES

Department of Child Health, University of Benin Teaching Hospital, PMB 1111, Benin City, Nigeria.

Abstract

Hepatitis C virus (HCV) infection is a global public health problem affecting both adults and children. It is a major contributor to chronic liver diseases. Africa reportedly has the highest seroprevalence. HCV infection is often a silent disease until the effects on the liver become manifest. Not many studies have evaluated HCV in Nigerian children. This study aims to determine the prevalence of antibodies to HCV (anti-HCV) and identify possible risk factors for HCV infection among Nigerian children.

This was a descriptive cross-sectional study which assayed for the presence of antibodies to HCV using Enzyme linked Immunosorbent assay in children admitted to the Children's Emergency Room of the University of Benin Teaching Hospital.

Of the 181 children screened, 18 were positive for anti HCV. All anti-HCV positive children were aged below 5 years. Males had a significantly higher prevalence (14.1%) than females (3.9%). Circumcision was also significantly associated with being sero positive for anti-HCV.

It is concluded that the prevalence of anti-HCV was high among the children studied. Male gender, age below 5 years circumcision were the significant risk factors for being anti-HCV positive.

Keywords: Hepatitis C, Nigerian, Children

Introduction

Hepatitis C virus (HCV) infection is a major global health issue.¹ Together with hepatitis B they are the most common causes of infectious chronic liver disease worldwide causing chronic hepatitis, cirrhosis, liver failure and hepatocellular carcinoma.²

Correspondence to:

Dr Ayebo ES

Department of Child Health
University of Benin Teaching Hospital
PMB 1111,
Benin City
Phone number +234 8033435312
Email address: ayebosadoh@yahoo.com

The estimated worldwide prevalence of hepatitis C is 3% with 170 million persons affected and 3-4 million new cases occurring yearly. The prevalence of HCV varies from region to region.¹⁻³ Africa is reported to have the highest prevalence estimated to be 5.3% with 32 million infected persons.³ Worldwide, 54,000 deaths and 955,000 disability adjusted life years are estimated to be associated with acute HCV infection.¹

In Nigeria most studies assessing the prevalence of HCV infection have been in adults or in specific subgroups of children such as sickle cell anaemia patients and HIV infected children.⁴⁻⁹ Prevalence rates among adult subjects have ranged between 3.6% and 12.3% in different reports from different geographic areas in Nigeria.⁴⁻⁷ Only few studies have evaluated HCV infection in the general population of Nigerian children. In Ibadan south western Nigeria, a prevalence of 0.9% was found in children and the authors concluded that HCV was at least already evident in the study locale.¹⁰ Ogboghodo et al¹¹ in Benin City, southern Nigeria noted a prevalence of 0.25% among children. Sadoh et al⁹ in the same locale found a higher prevalence of 5.2% in HIV infected children some years later while a study on children with sickle cell anaemia in South eastern Nigeria reported a prevalence of 6.6%.⁸ There is thus a need for studies on the general population of children in Nigeria. This is important to facilitate evidence based policy making and prudent resource allocation.¹

HCV is transmitted parenterally.³ In most of the developed world, numerous measures over the past decades have resulted in progressive reductions in the risk of transfusion –transmitted HCV infection.¹² In a review of HCV infection in Nigeria transfusion of blood was considered the commonest risk factor for HCV infection.¹³ Reports from several studies in Nigeria have however reported a lack of association between blood transfusion and HCV infection.⁶⁻⁹ More studies are thus required to elucidate the true role of blood transfusion as a risk factor for HCV infection. Other potential risk factors are re-usage of syringes and needles, tattooing, body piercing and sharing of household items such as nail clippers, razor blade and tooth brushes.¹³

HCV is also transmitted vertically and transmission is

said to occur in 5% of women infected with HCV.¹⁴ Maternal viraemia and HIV coinfection increases the risk of vertical transmission.² The finding in several studies of anti HCV in pregnant Nigerian women means children are indeed at risk of vertically acquiring HCV in Nigeria.^{4,6} In one Nigerian study 12% of infected mothers transferred antibodies to HCV to their newborns.⁵

HCV infection is often a silent disease being diagnosed most often as an incidental finding. The absence of a vaccine makes it imperative that children with HCV be identified and risk factors determined. Not only will this assist in the development of targeted preventive interventions but will allow early identification of infected children who will benefit from therapy. This study sought to determine the prevalence of anti-HCV antibodies in children and to identify any associated risk factors

Methods

The study was cross sectional and descriptive. It was carried out at the Children's Emergency Room (CHER) of the University of Benin Teaching Hospital, Benin City (UBTH). UBTH is a tertiary health facility which serves Edo state which is located in South South Nigeria (one of six geopolitical zones in Nigeria). It also serves as a referral centre for other surrounding states- Delta, Ekiti, Kogi, Anambra and Ebonyi states.

Ethical approval for the study was obtained from the University of Benin Teaching hospital ethics committee. Subjects were children admitted into the CHER. Verbal informed consent was obtained from parents of participating children. Consecutive children whose parents consented and children (10 years and older) who gave assent were recruited consecutively between December 2010 and May 2011

For each subject sociodemographic information (age, sex, parental education and occupation, number of persons living in the household) were obtained using a proforma. History of jaundice (in the past or in the present illness), use of unsafe injection, scarifications, ear piercing and circumcision was obtained. Physical examination for jaundice, pallor, splenomegaly, hepatomegaly and lymphadenopathy was carried out.

Laboratory methods

5mls of blood was aseptically obtained from a peripheral vein and put in a plain specimen bottle. The blood was centrifuged and serum separated and stored at -20°C until analysis was carried out. The serum was thawed at room temperature and antibodies to HCV were assayed for. Antibody to HCV (IgG) was assayed for using a DRG Enzyme Linked Immunosorbent assay kit by DRG International, inc (DRG HCV (Anti)

EIA-3896). Samples that were positive for anti-HCV were assayed for alanine transaminase (ALT) levels.

Analysis

Data was entered into an SPSS version 13 spread sheet. The presence of anti-HCV was reported as a simple percentage. The association between possible risk factors and the presence of anti-HCV was tested using Fisher's Exact test.

Results

One hundred and eighty one children were recruited but information was incomplete for 12 children who were excluded from all analysis except for prevalence. Of the 169 children who had sufficient data for analysis 92 (54.4%) were males and 77 (45.6%) females. The sociodemographic features of the children are shown on table 1. The modal age of the children was 15.5 months. Majority of the children were aged below five years of which 52.7% were below 18 months of age. The mean age of the mothers was 32.27±6.08 years with a range of 19 to 50 years while the mean age of the fathers was 39.12±7.22 years with a range of 23 to 63 years.

Prevalence of anti-HCV

Of the 181 children 18 (9.95%) had anti-HCV whereas 16 (9.47%) of the 169 with adequate data were positive. Of the 16 children positive for anti-HCV significantly more males 13 (81.3%) compared to females 3 (18.7%) were positive for anti-HCV. Anti-HCV was present in 13 (14.1%) of the 92 males and this was statistically significantly higher than in the females 3 (3.9%) $p=0.03$. Anti-HCV was present in

Table 1 Sociodemographic characteristics of the studied children

Characteristics	n	%
Sex		
Male	92	54.4
Female	77	45.6
Age of subjects (in months)		
< 18 months	89	52.7
= 18 months	80	47.3
Maternal Age (in years)		
=24	12	7.4
25-29	49	30.2
30-34	43	26.5
35-39	36	22.2
40-44	16	9.9
=45	6	3.7
Maternal level of education		
Nil	2	1.2
Primary	46	28.1
Secondary	41	25.0
Post secondary	75	45.7

9(10.1%) of 89 children aged below 18 months which was not significantly different from 7 (8.8%) of 80 children aged above 18 months. Table 2 shows the distribution of anti-HCV by age. All anti-HCV positive children were younger than 5 years. No child older than 5 years was anti-HCV positive. The association between age and being anti-HCV positive was significant $p=0.02$

Table 2 Age and Sex distribution of children positive for anti HCV

Characteristic	Anti HCV Status				P value
	Positive		Negative		
	n	%	n	%	
Sex					
Male	13	14.1	79	85.9	0.03
Female	3	3.9	74	96.1	
Age					
<5 years	16	11.8	120	88.2	0.02
5-9 years	0	0.0	21	100.0	
=10	0	0.0	12	100.0	

Table 3 Association of anti HCV with possible risk factors

Risk Factor	Anti HCV status				p value
	Positive		Negative		
	N	%	n	%	
Number of persons in HH					
=4	6	10.3	52	89.7	0.78
=5	9	8.7	94	91.3	
Place of Delivery					
Within health facility	12	8.6	127	91.4	0.25
Outside health facility	4	17.4	19	82.6	
Scarification					
Yes	2	9.1	20	90.9	0.06
No	14	10.1	125	89.9	
Unsafe Injections					
Yes	1	4.8	20	95.2	0.70
No	15	10.9	123	89.1	
Blood transfusion					
Yes	0	0.0	16	100.0	0.37
No	16	11.2	127	88.8	
Surgery					
Yes	0	0.0	3	100.0	0.23
No	16	10.3	140	89.7	
Circumcision					
Yes	15	13.3	98	86.7	0.04
No	1	2.1	47	97.9	

Serum Alanine transaminase levels

The mean serum transaminase (ALT) levels in patients who were anti HCV positive was 18.5 ± 9.23 IU/L with a range of 12.0-43.0 IU/L. None of the children had elevated ALT levels

Risk factors for anti-HCV

Table 3 shows the association between the presence of anti-HCV and some parameters. Of the 113 children who were circumcised 15(13.3%) were positive for anti-HCV compared to 1(2.1%) of 48 who were not circumcised. The association between circumcision and presence of anti-HCV was statistically significant ($p=0.04$). The number of persons in the household, place of delivery, scarification, unsafe injection, blood transfusion and surgery were not significantly associated with being seropositive for anti-HCV ($p<0.05$).

Discussion

The prevalence of anti-HCV in the children studied was 9.95%. This prevalence is higher than found in the few studies in Nigerian children.⁹⁻¹¹ It was also higher than the zero prevalence found in Tanzanian children and children from Ouagadougou.^{15,16} The prevalence was however comparable to the prevalence of 9% and 9.2% respectively reported among pregnant women and women of child bearing age in Nigeria,^{6,17} lending credence to the contribution of vertical transmission to HCV in Nigerian children. However some other studies have found lower prevalences - 4.7% in the general population in Enugu,⁵ 4.5% in pregnant women in Kaduna,¹⁸ and 3.6% also in pregnant women in Benin City⁴ (the study locale). The lower prevalence of anti-HCV among the pregnant women in the locale compared to the prevalence in this study may also suggest that other modes of transmission other than vertical are also operational. It is not clear as to why the differences in prevalence abound except that it may reflect differences in levels of endemicity and rate of transmission in the locales of the various studies. The prevalence in this study is also higher than reported from developed countries,¹⁷ which is in keeping with the higher prevalence in sub-Saharan Africa.

The higher prevalence found in this study compared to earlier studies^{9,11} also suggests possible increase in prevalence in the study locale. This would be in keeping with a recent review that reported a global increase in the prevalence of HCV although that review noted a decrease in prevalence in West Africa.¹ Onakewhor et al,²⁰ based on data collected from pregnant women in 2005 in the study locale reported a prevalence of 1.86% but Ogbemor et al⁴ also working on pregnant women in 2009/2010 in the same locale found a prevalence 3.6% suggesting a rise in the prevalence of HCV. Also the prevalence of 5.2% reported by Sadoh et al⁹ in HIV infected children is much higher than the 0.25% reported by Ogboghodo et al¹¹ (both studies were carried out in the same locale). The higher prevalence among the HIV infected children may however be contributed to by the fact that HIV increases the risk of vertically transmitted HCV which is a major source of HCV in children. The authors however opined that the finding of few children with HIV/HCV co-infection among under-fives suggested that routes of transmission other than vertical were operational.⁹

The presence of anti-HCV indicates either acute or chronic HCV infection.¹ It may also imply the presence of transferred maternal antibodies.² In this study 9(10.1%) of the children aged below 18 months were positive for anti-HCV. Although many children are able to clear maternally transferred anti HCV, in some

of them the anti-HCV persists indicating infection.²¹ These children will thus need follow up and repeat testing for anti-HCV after the age of 18 months when all maternal antibodies are expected to have disappeared. Definitive diagnosis of HCV in children is done after the age of 18 months. HCV RNA testing can however, be done to confirm infection in those younger than 18 months.²

Children older than 18 months had a prevalence of 8.8% which was not significantly different from the prevalence in those aged below 18 months. This may imply that HCV clearance is not significant or that some of the older children may have acquired the infection through routes other than vertically (a suggestion that has previously been made).⁹ This postulate is limited by the fact that this study was cross sectional.

All the children with anti-HCV were younger than 5 years. No child older than 5 years had anti-HCV. This suggests that HCV is acquired early in life. This finding is however at variance with that of an earlier study⁹ on HIV/HCV co-infection in which co-infected children tended to be older than 5 years. It is not clear as to why there was a difference in the age specific prevalence of HCV in the two studies. The under-representation of children older than five years in this study, may have been contributory to the observed differences. It is pertinent to note however that this study found a higher prevalence than the earlier study and the earlier suggestion that perhaps HCV infection was on the increase may be tenable. Such an increase may be associated with other epidemiologic changes such as new modes of transmission as well as age specific prevalences.

Significantly more males were positive for anti-HCV compared with females. It has been reported that females clear HCV more efficiently than do males.²² The finding in this study was in keeping with those of Okonko et al¹⁰ in Ibadan although that study is limited by the small number of those positive for anti-HCV. It could be postulated that perhaps an activity that predominantly involves males may be the risk factor for anti-HCV among the children studied. In Nigeria most males are circumcised as observed in this study. Female circumcision is widely carried out in Nigeria although there is said to be a marked decrease in younger cohorts compared to older cohorts.²³ This study found that a significant proportion of the females were circumcised. Circumcision was found to be significantly associated with being anti-HCV positive although circumcision was not limited to males alone. Some other studies have found significantly more women being positive for anti-HCV but no explanation was proffered for this finding.²⁴

There are conflicting reports on the association of blood transfusion with HCV infection. In this study blood transfusion was not significantly associated with anti HCV. This is in keeping with findings from several studies.^{4,5,9} This finding may not be unconnected with improved blood transfusion practices. In Nigeria, screening blood for HCV pre-transfusion has been incorporated into the national guidelines on blood transfusion.²⁵ Some other studies have found an association between blood transfusion and HCV infection. One study in children with sickle cell anaemia found an association with multiple transfusions of greater than four while finding no association in those with fewer transfusions.⁸ Similarly in a study on adults with sickle cell anaemia those who had regular blood transfusion had a significantly higher prevalence of anti-HCV compared to those who had never been transfused.²⁶

The presence of anti-HCV was not significantly associated with scarifications, unsafe injections and surgery. This finding may be due to improved practices involving sharps occasioned by HIV control efforts. HIV shares similar routes of transmission with HCV and control activities against HIV are also effective for preventing HCV. The lack of association between HCV and various factors has previously been reported.^{4,5} In one study the authors concluded that perhaps other routes of transmission may be the source of the infection.⁵

A history of jaundice, jaundice in the present illness, splenomegaly and hepatomegaly were not significantly associated with anti-HCV in this study. This is in keeping with the fact that HCV infection is mostly a silent disease until effects of liver pathology set in. Alanine aminotransferase was within normal range in all the HCV infected children in this study. However a normal ALT level is not a reliable indicator of a lack of hepatic inflammation.²

In conclusion antibody to HCV was highly prevalent in the children studied emphasizing the need for screening. Age, gender and circumcision were significantly associated with seropositivity. More studies to evaluate these associations are needed. Majority of the risk factors for transmission of HCV examined in this study were not significantly associated with being sero-positive for anti HCV. This calls for more studies to identify other possible mechanisms and risk factors for transmission. This will enable the development of screening protocols based on risk identification.

Limitation of study

HCV RNA was not tested for in this study. The cross sectional nature of this study makes it impossible to

determine if the antiHCV was eventually cleared or if the children were chronically infected

References

- [1] Hanafiah KM, Groeger J, Flaxman AD, Wiersma ST. Global epidemiology of hepatitis C virus infection: new estimates of age-specific antibody to HCV seroprevalence. *Hepatology* 2013;57:1333-42
- [2] Hsu EK, Murray KF. Hepatitis B and C in children. *Nat Clin Pract: Gastroenterol Hepatol* 2008;5:311-20
- [3] Karoney MJ, Siika AM. Hepatitis C Virus infection in Africa: a review. *Pan African Medical J* 2013;14:44.doi:10.11604/pamj.2013.14.44.2199
- [4] Ogbemor O, Aigbirior M, Osazuwa F, Enabudoso E, Zabayo O. The prevalence of hepatitis B and C viral infections among pregnant women. *North Am J Med Sci* 2011;3:234-41
- [5] Obieniu O, Nwokediuko S, Malu A, Lesi OA. Risk factors for hepatitis C virus transmission obscure in Nigerian patients. *Gastroenterology Research and Practice* 2011 DOI:10.1155/2011/939673
- [6] Ogunro PS, Adekanle DA, Fadero FF, Ogunbamigbe TO, Orinla AO. Prevalence of anti-hepatitis C virus antibodies in pregnant women and their offspring in a tertiary hospital in southwestern Nigeria. *J Infect Developing Countries* 2007;1:333-6
- [7] Halim NK, Ajayi OI. Risk factors and seroprevalence of hepatitis C antibody in blood donors in Nigeria. *East Afr Med J* 2000;77:410-2
- [8] Ejiofor OS, Ibe BC, Emodi IJ, Ikefuna AN, Ilechukwu GC, Emechebe G, Ilechukwu C. The role of blood transfusion on the prevalence of hepatitis C virus antibodies in children with sickle cell anaemia in Enugu, South East Nigeria. *Nig J Clin Pract* 2009;12:355-358
- [9] Sadoh AE, Sadoh WE, Iduoriyekemwen NJ. HIV co-infection with hepatitis B and C viruses among Nigerian children in an antiretroviral treatment programme. *SAJCH* 2011;5:7-10
- [10] Okonko I, Adepoju A, Okerentugba P, Nwanze J, Onoh C. Detection of hepatitis C virus antibody among children in Ibadan, south western Nigeria. *The Internet J Gastroenterol* 2012-11. DOI:10.5580/2b8f
- [11] Ogboghodo BC, Aigbirior MA, Bazuaye GN, Ebomoyi MI, Iyawe VI. Hepatitis C virus and Human Immunodeficiency virus-1 co-infection in children in Benin City. *Afr J Biomed Res* 2009;1:1-6
- [12] Shepard CW, Fineli L, Alter MJ. Global epidemiology of hepatitis C virus infection. *Lancet Infect Dis* 2005;5:558-67
- [13] Ejiofor OS, Emechebe GO, Igwe WC, Ifeadike CO, Ubajaka CF. Hepatitis C virus infection in Nigerians. *Niger Med J* 2010;51:173-176
- [14] Chang MH. Chronic hepatitis virus infection in children. *J Gastroenterol Hepatol* 1998;13:541-8
- [15] Muro FJ, Fiorillo SP, Sakasaka P, Odhiambo C, Reddy EA, Cunningham CK, Buchanan AM. Seroprevalence of hepatitis B and C viruses among children in Kilimanjaro region, Tanzania. *J Ped Infect Dis* 2013. Doi: 10.1093/jpids/pit018
- [16] Zeba MTA, Quattara CAT, Karou SD, Bisseye C, Ouermi D, Djigma FW et al. Prevalence of HBV and HCV markers among patients attending the Saint Camille medical centre in Ouagadougou. *Pakistan J Biol Sci* 2012;15:484-9
- [17] Nwankiti OO, Ejekwolu AJ, Ndako JA, Chollom S, Samuel E. A survey for antibodies to hepatitis C virus among women of childbearing age. *Nat Sci* 2012;10:148-152
- [18] Sheyin Z, Jatau ED, Mamman AI, Randawa AJ, Bigwan IE. Detection of hepatitis C virus amongst pregnant women in Kaduna state, Nigeria. *Wudpecker J Med Sci* 2012;1:12-15
- [19] Mack CL, Gonzalez-Peralto RP, Gupta N, Leung D, Narkewicz MR, Roberts EA et al. NASPGHAN practice guidelines: Diagnosis and management of hepatitis infection in infants, children and adolescents. *J Ped Gastroenterol Nutr* 2012;54:838-55
- [20] Onakewhor JU, Okonofua FE. Seroprevalence of hepatitis C viral antibodies in pregnancy in a tertiary health facility in Nigeria. *Niger J Clin Pract* 2009;12:65-73
- [21] Resti M, Azzari C, Manneli F, Moriondo M, Novembre E, de Martino M et al. Mother to child transmission of hepatitis C virus: prospective study of risk factors and timing of infection in children born to women seronegative for HIV-1. *BMJ* 1998;317:437-440
- [22] Bakr I, Rekecewicz C, El-Hosseiny M. Higher clearance of hepatitis C virus infection in females compared with males. *Gut* 2006;55:1183-1187
- [23] Abiodun AA, Oyejola BA, Job O. Female circumcision in Nigeria, prevalence and attitudes. *Centrepoin J* 2011;17:89-98
- [24] Jeremiah ZA, Koate B, Buseri F, Emelike F. Prevalence of antibodies to hepatitis C virus in apparently healthy Port Harcourt blood donors and association with blood groups and other risk indicators. *Blood transfusion* 2008;6:150-155
- [25] Federal Ministry of Health National blood transfusion service. Nigerian National Blood Policy. Revised November 2005
- [26] Nwannadi IA, Alao OO, Bazuaye GN, Omoti CE, Halim NK. Seroprevalence of hepatitis C virus antibody in sickle cell anaemia patients in Benin City, Nigeria. *Gomal J Med Sci* 2012;10:15-18

Antinociceptive And Antipyretic Properties Of *Tapinanthus Dodoneifolius* Leaf Extract In Albino Rats

Imam-Fulani AO, Baba MA, Owoyele BV

Department of Physiology, University of Ilorin, Ilorin, Nigeria.

Abstract

The present study was designed to investigate the analgesic and antipyretic effects of the ethanolic extract of dried leaves of *Tapinanthus dodoneifolius* (DC, VANTIEGH) in rats using three laboratory models: brewers' yeast induced hyperpyrexia test, formalin-induced paw licking and hot plate latency test respectively. The extract (25-200mg/kg) caused a significant ($P<0.05$) decrease in body temperature of the animals. The extract (25-200mg/kg) also significantly ($P<0.05$) increased the reaction time of the animals to thermal stimuli and also significantly ($P<0.05$) decreased both the early and late phases of formalin induced paw licking in rats. This indicates that the extract increased pain threshold in the hot plate latency test and in the early and late phases of the formalin-induced paw licking in rats. The result also indicated an ability of the plant to reduce pyrexia in albino rats.

Keywords: *Tapinanthus dodoneifolius*, Antipyretic, Pain threshold, Rats

Introduction

Tapinanthus dodoneifolius (DC, Vantiegh), is a parasitic plant of West-African origin. It is one of the medicinal plants used locally for the treatment of several human and animal ailments¹. The leaves and young twigs of the plants have also been used in folklore medicine to treat different diseases such as circulatory and respiratory diseases, malaria, diabetes, hypertension and sterility². The cardiovascular, spasmolytic and anti inflammatory activities of water extract of *A. dodoneifolius* have been reported³. Cepleanu *et al.*⁴ also reported the larvicidal and molluscicidal activities of this plant. Preparations of *Tapinanthus dodoneifolius* have been used in the traditional Nigerian medicine to treat malaria and this practice has remained till date without scientific validation⁵.

Pain has been defined by IASP⁶ as an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. Pain, inflammation and fever usually have some molecular mechanism in common especially through the release prostaglandins. This form the basis for the use on non steroidal anti-inflammatory drugs (NSAIDs)⁷. Furthermore, pain usually accompanies fever and treatment of pain symptoms with analgesics may provide temporary relief for individuals suffering from fever⁸. Therefore, it might be either the pain or fever component that the extract of *Tapinanthus dodoneifolius* ameliorates when feverish individuals administer the extract therapeutically. However, there is a dearth of information on the effect of this plant extract on pain threshold and pyrexia. Therefore, the present study was carried out to investigate the anti-nociceptive and antipyretic properties of the leaf extract of the plant in rats in accordance with its ethnomedicinal uses by local folks.

Materials And Methods

Animals

Male and female Wistar rats weighing 200-230 g were used for the study. The animals were bred and housed in the animal house of the Faculty of Basic Medical Sciences, University of Ilorin. The animals were kept in clean, standard cages that are well ventilated. They were provided with mouse cubes (Bendel feeds) and water *ad libitum* prior to the commencement of the antipyretic and analgesic studies.

The research was conducted in accordance with the ethical rules on animal experimentation, and approved by the use of animal ethical committee of the University of Ilorin.

Plant and extract

Tapinanthus dodoneifolius leaves were collected in Tanke area, Ilorin, Kwara State, Nigeria. The plant was identified by Mr Felix Inah of the Forestry Research Institute of Nigeria (FRIN, Ibadan) where a voucher specimen with herbarium file number FHI 107663 was deposited.

The leaves of *T. dodoneifolius* were air-dried, reduced to powdered form and sieved to obtain fine powder.

Correspondence to:

Owoyele BV PhD

Department of Physiology,

University of Ilorin,

Ilorin, Nigeria

Email: deleyele@yahoo.com or

owoyele@unilorin.edu.ng

500g of the powder was put in and soaked in 2,500ml ethanol, shaken and allowed to stand for 24hours. The macerated mixture was filtered and evaporated in a carefully regulated water bath maintained at temperature of 50°C to yield a deep green semi-solid extract weighing 39.5g which was stored at 4°C in a refrigerator.

Experimental Procedure

Antipyrexia study

Brewers' yeast induced hyperpyrexia test

This study was carried out by slightly modifying the method described and employed by Sharma et al.⁹. The animals were divided into six groups A-F (comprising five animals each). Pyrexia was induced by subcutaneously injecting 20% (w/v) brewers' yeast suspension (10ml/kg) into the dorsum of the rats. 17hours after injection, the rectal temperature was measured using clinical digital thermometer. Rats that showed increase in temperature of at least 0.7°C were used for the test. Rats grouped A-D were given 25, 50, 100 and 200 mg/kg of extract orally, which represent very low, low, medium and high dose respectively. Rats in group E and F were given normal saline (10ml/kg) and indomethacin (5mg/kg) respectively. The initial rectal temperature of the rats prior to brewers' yeast injection was measured and compared with the temperature measured at 60, 90, and 120 minutes after each administration of the respective oral solutions.

Antinociceptive study

Hot plate latency test

This was carried out by slightly modifying the method used previously¹⁰. The rats were placed on hot plate maintained at 55°C ± 1 °C and confined with a carbon box 50cm high. The time taken for the rat to jump off the plate was recorded as the latency in seconds. The

rats used for this study were fasted 12 hours before the test and subsequently divided into six groups (A-F). Rats in B, C, D, and E were given 25, 50, 100 and 200 extract of *T. dodoneifolius* orally after twelve hours fast respectively. Rats in group A and F were given doses of normal saline (10mg/kg) and indomethacin (5mg/kg) respectively. One hour after extract/drug administration, each rat was placed on the hot plate and the latency time recorded, subsequent measurements were conducted at 30, 60 and 90 minutes respectively for all groups.

Formalin induced paw licking test

This was carried out by method previously described¹¹. The rats were divided into six groups (A-F). Rats in B, C, D, and E were given 25, 50, 100 and 200 extract of *T. dodoneifolius* orally after twelve hours fast respectively. Rats in group A and F were given doses of normal saline (10mg/kg) and indomethacin (5mg/kg) respectively. One hour after extract/drug administration, formalin was injected into the left hind paw, of the animals and the time spent by each rat in licking the injected paw in the early (0-5 minutes) and late (20-30 minutes) phases were recorded.

Statistical analysis

In these studies values are expressed as mean ± standard error of mean (SEM). Statistical significance was determined using the ANOVA followed by Duncan post hoc test and values were accepted as significant when p<0.05.

Results

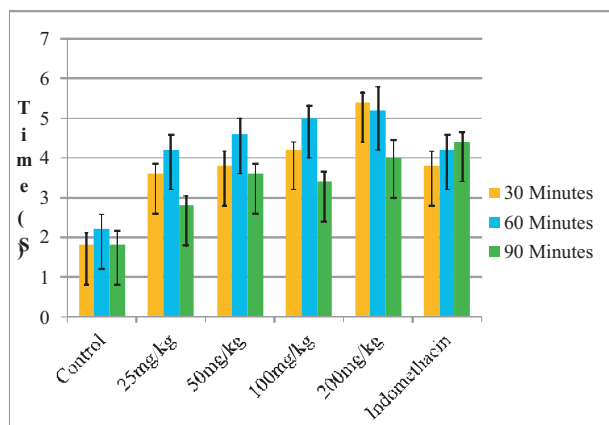
Antipyrexia study

The 25 mg/kg body weight of the ethanolic extract of *T. dodoneifolius* leaves significantly reduced the elevated rectal temperature from 37.2± 0.12 to 36.8± 0.01 after 90 minutes of its administration. All the

Table 1: Effect of ethanolic extract of *T. dodoneifolius* on brewers' yeast induced hyperpyrexia test.

Group	Dose (mg/kg) Orally	Temp.(°C) after 17 hours of yeast injection	Temp.(°C) at different time intervals after saline/extract administration		
			60mins	90mins	120mins
Control (Normal saline)	10	37.75±0.1	37.62±0.11	37.41±0.16	37.32±0.18
<i>T. dodoneifolius</i>	25	37.20±0.12	37.0±0.13	36.80±0.01 *	36.60±0.09 *
<i>T. dodoneifolius</i>	50	37.57±0.17	37.17±0.20	36.76±0.227 *	36.40±0.31 *
<i>T. dodoneifolius</i>	100	38.04±0.127	37.44±0.225	37.05±0.29 *	36.83±0.38 *
<i>T. dodoneifolius</i>	200	38.20±0.21	37.6±0.14 *	37.30±0.01 *	37.0±0.16 *
Indomethacin	5	36.0±0.15	36.21±0.38 *	35.20±0.39	34.80±0.40

Each value represents the mean ± SEM for 5 rats. *P < 0.05 compared to temperature 17 hours after yeast injection .



higher doses of the extract and indomethacin follow the same pattern as shown in table 1

Antinociceptive study

Hot plate latency test

The results of this study is shown in figure 1 and it shows that the extract significantly increase the reaction time of the animals to thermal stimuli starting from 30 minutes to 60 minutes compared to the control. The highest dose (200 mg/kg body weight) produced consistent anti nociception on the hotplate compared with the control and other groups.

Formalin induced paw licking test

In figure 2, the 25 mg/kg ethanolic extract of *T. dodoneifolius* significantly ($p < 0.05$) reduced the time spent on paw licking from 131.2 ± 13.6 to 93.2 ± 6.1 and 159.8 ± 7.1 to 105.8 ± 7.7 in the early and late phases of the test respectively. The higher doses followed the same pattern.

Discussion and Conclusion

The present study investigated the effects of *T. dodoneifolius* on pain threshold and pyrexia using common animal models. The results showed that *T. dodoneifolius* extract has significantly increased pain threshold using the hotplate as well as the formalin models. This indicates that the extract can inhibit pain resulting from direct neuronal stimulation (formalin, first phase) and those arising from inflammatory processes (Formalin, second phase)¹¹⁻¹³. Result from the brewers yeast also show that the extract could significantly reduce experimentally induced pyrexia although the mechanism is not clearly understood.

It is not surprising that *T. dodoneifolius* has anti-nociceptive effects especially a direct effect on the nervous system as represented by the activity on the thermal test and first phase of the formalin test^{11,13} because previous reports show that the plant has the ability to calm nerves and heart problems among other properties^{12, 14-15}. Indeed, the thermally induced pain has been designated as a form of central pain involving

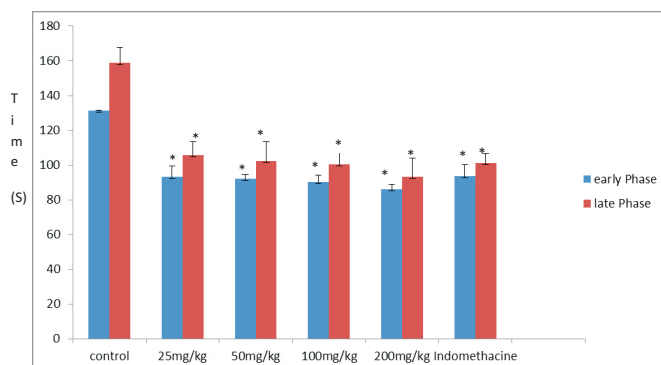


Figure 2. Effect of *T. dodoneifolius* extract on formalin induced paw licking in rats. * $P < 0.05$ compared with control group

modulation of pain pathways not only in the peripheral areas but in spinal cord and agents/drugs that have ability to reduce the reaction time in this model have the potential to be strong analgesics¹⁶⁻¹⁷.

The brewer's yeast is a common and inexpensive model for assessing antipyretic activities in rodents. The weakened yeast is a source of external pyrogen which has the capacity to trigger the endopyrogens and ultimately stimulate measurable pyrexia by increasing prostaglandins E_2 . In the resent study, it was observed that the extract even at the lowest dose was able to significantly reduce the pyretic state of the animals although after 9 minutes of administration. This shows that the extract at low dose is effective but it has the slightly delayed onset of action compared with the highest dose which is effective even from 30 minute after its administration to pyretic animals.

Generally the trend of the results indicate that there might be a common mechanism for the activities of this plant extract. This mechanism was not examined in the present study, however, it might not be unconnected with inhibition of cyclooxygenase (COX) which the NSAIDs inhibits to achieve their therapeutic effects. NSAIDs have moderate analgesic, anti-inflammatory and antipyretic effects linked to inhibition of COX and ultimately prostanglandins synthesis⁷.

Furthermore, medicinal properties of plants and natural substances are usually derived from their constituents especially the secondary metabolites and this would be the case for *T. dodoneifolius*. Fasanu and Oyedepo¹⁸ reported that the plant contains phytochemicals like alkaloids and saponins. The results of the mineral analysis of the major cations also show that the leaves, the stem bark of the host plants and the mistletoe growing on them contain major cations like potassium, magnesium, calcium and sodium in varying quantities. Therefore, the probable mechanism underlying the activities of the plant might

be associated with its active agents. Previous studies have shown the active agents to be alkaloids, saponins and tannins¹⁹. Phytochemicals help plants defend against environmental challenges and also provide humans with protection against various diseases as well. Hence it is not surprising while they are harvested for medicinal purposes. These compounds have the ability to reduce pain perception in the models used.

In conclusion, this study has shown that ethanol extract of *T. dodoneifolius* has the capacity to increase pain threshold and reduce pyresis in animals which might be based on its phytochemical constituents. Further studies are required to isolate and characterise the active ingredients in the plant.

References

- Deeni YY and Sadiq NM. Antimicrobial Properties and Phytochemical Constituents of the Leaves of African Mistletoe (*Tapinanthus dodoneifolius*) (DC) Danser (Loranthaceae): An Ethnomedicinal Plant of Hausaland, Northern Nigeria. *J ethnopharmacol.* 2002; 83 (3): 235-240.
- Efuntoye MO, Ayodele AE, Thomas BT, Ajayi TO. Does host plant affect the antibacterial activity of *Tapinanthus bangwensis* (Engl. and K. Krause) Danser (Loranthaceae)? *J Med Plant Res.* 2010;4:1281–1284.
- Ouédraogo S, Traoré A, Somé N, Lompo M, Guissou PI, Schott C, et al. Cardiovascular properties of aqueous extract from *Tapinanthus dodoneifolius* DC DANSER. *Afr J Tradit Complement Altern Med.* 2005;1:25–30.
- Cepleanu F, Hamburger MO, Sordat B, Msonthi JD, Gupta MP, Saadou M, et al. Screening of tropical medicinal plants for molluscicidal, larvicidal, fungicidal and cytotoxic activities and brine shrimp toxicity. *Int J Pharmacol.* 1994;323:294–307.
- Builders MI, Uguru MO and Aguiyi C. Antiplasmodial Potential of the African Mistletoe: *Agelanthus dodoneifolius* Polh and Wiens. *Indian J Pharm Sci.* 2012; 74(3): 223-229.
- Merskey H, Bogduk N (eds). Classification of chronic pain: descriptions of chronic pain syndromes and definitions of pain terms, 2nd edn. IASP Press, Seattle. 1994.
- Neal MJ. Medical Pharmacology at a Glance. Blackwell series pp, 1991; 62-67.
- Turkoski BB. Acetaminophen by infusion. *Orthop Nurs.* 2015; 34(3):166-169.
- Sharma S, Lata S, Kumar A and Srivastava VK. Evaluation of analgesic, antipyretic and anti-inflammatory activities of spirobarbitunyl phenothiazines in rodents. *Indian J. physiol pharmacol.* 2002; 46(2): 235-240.
- Owoyele BV and Soladoye AO. Analgesic and anti-inflammatory activity of ethanolic extract of *Chromolaena odorata* leaves. *Recent Progr. Med. Plants,* 2007; 18:397-406.
- Hunskar S, Hole K. The formalin test in mice: dissociation between inflammatory and non-inflammatory pain. *Pain.* 1987; 30: 103–114
- Traore R. Pharmacological effects of *T. dodoneifolius* aqueous extract on animals; used traditionally as anti-asthmatic in Burkina Faso. *J. Pharm FSS University of ouagadougou, Burkina Faso.* 2000; 94p.
- Owoyele BV, Oladejo RO, Ajomale K., Ahmed OR. and Mustapha A. Analgesic and anti-inflammatory effects of honey: the involvement of autonomic receptors. *Metabolic Brain Disease.* 2014; 29:167–173.
- Hoagy S. Harvesting Real Mistletoe for Christmas. *Hoagy Scoins,* 2008.
- Ogunmefun OT, Fasola TR and Oridupa OA. Ethnobotanical, Phytochemical and Mineral Analyses of *Phragmanthera Incana* (Klotzsch), A Species of Mistletoe Growing on Three Plant Hosts in South-Western Nigeria. *Int J Biomed Sci.* 2003; 9(1): 33–40.
- Prado WA, Tonussi CR, Rego EM, Corrado AP: Antinociception induced by intraperitoneal injection of gentamicin in rats and mice. *Pain* 1990;41:365–371.
- Owoyele BV, Okoye OC, Dolor RO, Oloruntola OP. and Soladoye AO. Analgesic, Anti-inflammatory and Antipyretic effects of the ethanolic extract of *Acalypha wilkesiana* leaves in rats. *Nigerian Journal of Physiological Sciences* 2011; 26(1); 77-82
- Fasanu PO and Oyedapo OO. Phragmanthin-peptide from fresh leaves of African mistletoe (*Phragmanthera incana*): purification and metabolic activities. In: Singh VK, Govil JN, editors. *Phytopharmacology and therapeutic values I.* 2008; pp. 39–47.
- Hostanska K, Vuong V, Rocha S, Soengas MS, Glanzmann C, Saller R, Bodis S and Pruschy M. Recombinant mistletoe lectin induces p53-independent apoptosis in tumour cells and cooperates with ionising radiation. *British Journal of Cancer,* 2003; 88: 1785 – 1792

Role of Routine Preoperative Laboratory Testing in Patients Undergoing Elective, Low-Risk Day Case Surgery

Idris OL, Kolawole OA, Adejumo MO, Adedeji OA

Department of Surgery, Ladoke Akintola University of Technology
Teaching Hospital, PMB 5000, Osogbo, Osun State, Nigeria.

Abstract

This study aims to determine whether Routine Preoperative Laboratory Testing has any impact on the perioperative surgical outcome in patients undergoing elective low-risk Day Case Surgery.

A prospective study where eligible adult patients scheduled for elective, low-risk procedures under local anaesthesia were recruited. The results of routine Packed Cell Volume and urinalysis, with perioperative surgical outcome, including the estimated blood loss, were examined.

A total of 141 patients underwent elective low-risk procedures which included 61 (43.3%) excisional biopsies of breast lumps, 43 (30.5%) inguinal herniorrhaphies, 14 (9.9%) lipoma excisions, 12 (8.8%) hydrocelectomies, 4 (2.8%) dermoid cyst excisions, 4 (2.8%) umbilical herniorrhaphies, 2 (1.4%) ganglion excision and 1 (0.7%) excision of ingrowing toe-nail. All the patients have normal Packed Cell Volume results and 139 (98.6%) of them had normal urinalysis results, while 2 (1.4%) had abnormal results, one of these still had the procedure as scheduled after further consultation and the other had the procedure deferred for further management.

Routine preoperative laboratory tests in patients undergoing elective low-risk day case surgery are of little value in detecting diseases and in changing perioperative management or outcome. Thorough history and physical examination followed by a few selective investigations based on patient's health condition, invasiveness of planned surgery and potential for blood loss is more important. An approach of selective investigations reduces cost without having to sacrifice safety or quality of surgical care.

Key words: Routine, Preoperative Laboratory Tests, Low-Risk, Day Case Surgery.

Introduction

For more than two decades, the indications for Day Case Surgery (DCS) have been expanded, with an increasing number of surgical procedures being performed as day cases. Day case surgery now account for about 60-70% of surgical procedures performed in the United States^{1,2}. Day case surgical procedures are generally less than 2 hours in duration, have low expected blood loss and complication rates, follow an uneventful postoperative course, and are usually performed on patients with no medical problems or with stable chronic medical conditions i.e. American Society of Anaesthesiologists (ASA) class I or class II. Preoperative testing has been part of the preoperative care process to inform patient selection by determining fitness for anaesthesia and identifying patients at high risk of postoperative complications.³ Preoperative tests include blood tests, urine tests, chest radiography, and electrocardiogram (ECG). Routine preoperative tests are defined by the American Society of Anaesthesiologists as those tests done, within 30 days before surgery, in the absence of any specific clinical indication. These routine tests are performed to detect latent abnormalities and such tests include packed cell volume to detect asymptomatic anaemia, urinalysis to screen for asymptomatic diabetes mellitus or ECG to detect silent heart disease, which can affect the planned surgical procedure and anaesthesia.¹⁻³

While the cost of the individual tests may be low, the aggregate costs can be substantial.^{1,4,5} In the United States, the estimated cost of preoperative testing is between \$3 billion to \$18 billion annually.^{1,6-8} In 2002, the "Practice Advisory" of American Society of Anaesthesiologists (ASA) concluded that "routine" preoperative testing does not make a valuable contribution to preoperative evaluation while "indicated" testing may help preoperative management decision making.² An indicated test is one that is required by specific clinical features or preexisting medical conditions.²

Methodology

This was a prospective study involving patients

Correspondence to:

Dr Idris OL

Department of Surgery,
Ladoke Akintola University of Technology
Teaching Hospital, PMB 5000, Osogbo.
Phone numbers: 2348035959693
E-mail address: idrisol@yahoo.com

scheduled to undergo elective low-risk Day Case Surgeries (DCS) between 1st June, 2013 and 31st May, 2014. These procedures which included excisional biopsy of benign breast lumps, inguinal herniorrhaphy, lipoma excision, hydrocelectomy, dermoid cyst excision, umbilical herniorrhaphy, ganglion excision and excision of ingrowing toe-nail. This study was ethically approved by Ethics and Research Committee of the institution and written informed consent was also obtained from each patient before being enrolled into the study. The inclusion criteria included patient who is 16 years or older, not clinically pale, scheduled to undergo low-risk DCS under Local Anaesthesia (LA), low expected blood loss and ASA class I or II. Exclusion criteria included patient with clinical palor, younger than 16years, need for general anaesthesia, risk of major blood loss, history of coagulopathy, ASA class III or IV and failure to give consent.

Preoperative assessment of each eligible patient was done a week before the scheduled surgery and after written informed consent was taken, the routine packed cell volume and urinalysis were ordered by the attending doctor (consultants or residents) according to the tradition in our centre. The results of these tests were reviewed and recorded in the surgical chart on the day of surgery and patient then proceeds with the surgery, unless the patient presented with a new or worsening medical problem that would warrant medical evaluation with testing even if surgery were not planned. Clinical assessment outcome was correlated with the results of investigations so as to evaluate the clinical significance of these tests. Data analysis was done using Statistical Package for Social Sciences (SPSS) version-16.

Results

During the study period, one hundred and forty-one eligible patients were enrolled into the study. The age range of patients was 16 – 82 years with the mean age of 35.9 ± 17.8 (SD) years. Females constituted 52.5% of the study population (n = 74). Majority of the patients had no comorbid illnesses and thus belonged to the American Society of Anesthesiologists (ASA) class I (n = 130; 92.2%). Sample characteristics are summarized in Table 1.

Most of the patients (n = 114; 80.9%) were assessed in the clinic by the consultant surgeon and the two routine preoperative investigations requested per patient per surgery, for all patients included in this study, were the packed cell volume (PCV) and urinalysis. The PCV range was between 30% – 49% with the mean PCV of 35.9 ± 17.8 (SD) percent. Most of the patients had normal urinalysis result (n = 135; 95.7%) and the remaining patients had insignificant proteinuria (n = 3; 2.1%), nitrite (n = 1; 0.7%) and

glycosuria (n = 2; 1.4%) out of which only one (0.7%) of these patients had the procedure deferred for further preoperative management. The mean estimated blood loss (EBL) was 14.2 ± 6.2 (SD) milliliters (mls). None of the patients had unexpected blood loss perioperatively and there was no incidence of perioperative blood transfusion. All the patients were discharged home, after surgery, as scheduled.

Table I: Characteristics of the study population

Gender	Number of patients	Percentage
Male	67	47.5
Female	74	52.5
ASA classification		
ASA I	130	92.2
ASA II	11	7.8
Comorbid illness		
No illness	130	92.2
Hypertension	8	5.7
Diabetes mellitus	2	1.4
Bronchial asthma	1	0.7
Rank of attending doctor		
Consultant	114	80.9
Senior registrar	1	0.7
Registrar	26	18.4
Surgical procedure		
Breast lump excision	60	42.6
Inguinal herniorrhaphy	44	31.2
Lipoma excision	14	9.9
Hydrocelectomy	12	8.5
Umbilical herniorrhaphy	4	2.8
Dermoid cyst excision	4	2.8
Ganglion excision	2	1.4
Excision of ingrowing toe-nail	1	0.7

Discussion

To our knowledge, in this environment, there is paucity of studies on the role of preoperative laboratory testing in patients undergoing elective low-risk day case surgery under local anaesthesia (LA). Our study demonstrates that routine preoperative testing before elective, low-risk DCS, under LA, is not indicated. The overall incidence of abnormal result (mainly urinalysis) in our study was less than 1% (both patients were older than 55years) and after controlling for patient's comorbidities and operative procedure, we found that neither testing nor abnormal results were associated with postoperative complications. Most of the abnormalities in laboratory values can be predicted from the patient's history and findings on clinical examination; moreover, abnormalities discovered on routine laboratory tests rarely lead to changes in perioperative treatment of patients⁹. Kaplan et al (1985) found that only 0.22% of routine tests done prior to elective surgery showed abnormalities that could have influenced perioperative management^{9,10}. Previous studies have shown that routine preoperative testing might not be necessary^{1,10,11} and several authors

have evaluated outcomes after no preoperative testing at all. On the basis of single institution studies and literature reviews, many advocate against routine preoperative laboratory testing in asymptomatic and clinically normal patients who are undergoing elective, low-risk surgery^{1,5,6,8,12-14}. It has been shown that abnormal results in testing done before elective low-risk DCS change management in less than 3% of cases^{1,2,14,15}. Although these groups advocate against “routine” testing, they fail to outline clear and consistent guidelines of indications for specific tests. Also, in 2000, Schein et al^{1,16} reported the results of a randomized controlled trial comparing routine versus no preoperative testing in patients undergoing cataract surgery, a procedure generally performed in older patients with a high prevalence of comorbid conditions. They demonstrated no difference in outcomes between the two groups. These findings suggest that a large proportion of preoperative testing for DCS, even in patients with stable comorbid illness, is of questionable clinical benefit and can be eliminated without significant adverse medical consequences. This will translate into decreased costs, both for initial testing and additional unnecessary testing due to abnormal results, with limited clinical significance. The patient satisfaction may also improve by limiting patients' discomfort and anxiety related to abnormal but clinically insignificant results. Previous studies arguing against routine preoperative testing have their origin in the anaesthesia literature and were perhaps targeted at wrong audience because it has been shown that about 80% of preoperative tests are ordered by surgeons and that the majority of these are not clinically indicated^{1,12}. Preoperative evaluation should concentrate on comprehensive history and a focused physical examination, and laboratory tests should therefore be selected based on specific symptoms, signs or diagnosis and not routine. Our study has shown that preoperative PCV in clinically healthy patients scheduled for low-risk DCS under LA, is unnecessary. While we also state that routine urinalysis in these patients is not justified, we will recommend preoperative screening for diabetes mellitus in patients older than 40 years. There is need for review of our practice tradition, institutional policies and an increased awareness of evidence and guidelines for ordering these tests.

References

1. Jaime Benarroch-Gampel, Kristin M. Sheffield, Casey B. Duncan, et al. Preoperative Laboratory Testing in Patients Undergoing Elective, Low-Risk Ambulatory Surgery. *Ann Surg.* 2012 September ; 256(3):518–528.
2. Frances Chung, Hongbo Yuan, Ling Yin, et al. Elimination of Preoperative Testing in Ambulatory Surgery. *Ambulatory Anesthesiology.* February 2009; 108 (2): 467–475.
3. Aditya Kumar, Uma Srivastava. Role of Routine Laboratory investigations in preoperative evaluation. *Journal of Anaesthesiology Clinical Pharmacology,* April-June 2011; 27 (2): 174–179.
4. Kaplan EB, Sheiner LB, Boeckmann AJ, et al. The usefulness of preoperative laboratory screening. *JAMA.* 1985; 253:3576–3581. [PubMed]
5. Allison JG, Bromley HR. Unnecessary preoperative investigations: evaluation and cost analysis. *Am Surg.* 1996; 62:686–689. [PubMed]
6. Fischer SP. Cost-effective preoperative evaluation and testing. *Chest.* 1999; 115(suppl):96S–100S. [PubMed]
7. Johnstone RE, Martinec CL. Costs of anesthesia. *Anesth Analg.* 1993; 76:840–848. [PubMed]
8. Richman DC. Ambulatory surgery: how much testing do we need? *Anesthesiol Clin.* 2010; 28:185–197. [PubMed]
9. Ngozi Imasogie, David T. Wong, Ken Luk, et al. Elimination of routine testing in patients undergoing cataract surgery allows substantial savings in laboratory costs. A brief report. *Can. J. Anesth* 2003; 50:246–248
10. Chung F, Yuan H, Yin L, et al. Elimination of preoperative testing in ambulatory surgery. *Anesth Analg.* 2009; 108:467–475. [PubMed]
11. Narr BJ, Warner ME, Schroeder DR, et al. Outcomes of patients with no laboratory assessment before anesthesia and a surgical procedure. *Mayo Clin Proc.* 1997; 72:505–509. [PubMed]
12. Bryson GL, Wyand A, Bragg PR. Preoperative testing is inconsistent with published guidelines and rarely changes management. *Can J Anaesth.* 2006; 53(3):236–241. [PubMed]
13. Delahunt B, Turnbull PR. How cost effective are routine preoperative investigations? *N Z Med J.* 1980; 92:431–432. [PubMed].
14. Turnbull JM, Buck C. The value of preoperative screening investigations in otherwise healthy individuals. *Arch Intern Med.* 1987; 147: 1101–5
15. Osborne GA, Rudkin GE. Outcome after day-care surgery in a major teaching hospital. *Anaesth Intens Care* 1993; 21: 822–7
16. Schein OD, Katz J, Bass EB, et al. The value of routine preoperative medical testing before cataract surgery. *Study of Medical Testing for Cataract Surgery.* *N Engl J Med.* 2000; 342:168–175. [PubMed]

Broken Dental Needle During Administration of Inferior Alveolar Nerve Block: a Case Report and Review of Literature

¹Adeyemi MF, ¹Ibraheem GH, ¹Ernest MA, ²Adeyemo WL, ³Ernest SK

¹Department of Surgery, University of Ilorin Teaching Hospital, Ilorin, ²Department of Oral & Maxillofacial Surgery, University of Lagos, ³Department of Paediatrics & Child Health, University of Ilorin

Abstract

Administration of local anesthesia using dental needles is a daily routine in the dental clinic which is rarely accompanied with complications. We therefore present a 7 year old patient with accidental broken dental needle that occurred in an attempt to give local anaesthesia in a referral Centre. Plain radiographs revealed a radio-opaque structure around the zygomatic arch extending posteriorly to the mastoid air cells which enhanced surgical retrieval under general anaesthesia. This is the first time such a case is being encountered and reported in Ilorin. This case highlights absolute indication and method for surgical retrieval and suggestions for prevention of such occurrences in the future were discussed.

Key word : Dental needle, Inferior alveolar nerve block, Surgical retrieval

Introduction

Metal instruments used in dental practice may be subjected to considerable wear and tear and subsequent breakage¹. Needle breakage during administration of local anesthesia has now become a rare occurrence compared to the early part of this century when it was relatively more common². In a study by Blum over a period of 14 years, from 1914 -1928, a hundred cases of broken needles were reported³. Since the introduction of modern disposable stainless flexible alloys in the early 1960s, such events have become relatively rare⁴.

Various reasons can be attributed for breakage of dental needles⁵: Weakness of the alloy, narrowness of the needle, reusage of the needle, incorrect injection technique such as bending of the needle, sudden jerky movement of the patient or practitioner and manufacturer defects⁵.

Broken dental needles usually result in great anxiety by the patient, parents / guardian and the Dental Surgeon. Preventing dental needle breakage is important as it can be a great traumatic experience for the patient.

Surgical removal of a broken dental needle can be a difficult procedure due to proximity to vital anatomical structures of the region. Various surgical techniques have also been used in the retrieval of a broken dental needle.

This case report describes the occurrence of a broken dental needle in a 7- year old patient in the pterygomandibular space and the method of surgical removal

Case Report:

A 7- year old patient was referred to our institution on account of pain on the right side of the face secondary to a broken dental needle during administration of inferior alveolar nerve block about 2 weeks previously. The dental needle got broken in an attempt to administer an inferior alveolar nerve block in order to extract a badly carious tooth in the referring Center. The patient was reported to have jumped from the dental chair during the injection, resulting in the breakage of the needle. An attempt was made to retrieve the broken dental needle but it proved abortive at the referring center. The parent was informed about the incident. The consequence and the risk of keeping the needle fragment in tissues were explained to the parent. Treatment options were also explained to the parent. Radiographs were taken to identify the location of the fragment. Examination revealed a healthy girl with an

Correspondence to:

Dr Moshood Folorunsho ADEYEMI,
Lecturer & Consultant Maxillofacial Surgeon,
University of Ilorin Teaching Hospital,
Ilorin

obvious right preauricular swelling extending down to the submandibular region. There was no associated lymphadenopathy. No visible pathology was seen intraorally. Plain radiographs revealed a radio-opaque structure around the zygomatic arch extending posteriorly to the mastoid air cells (Figure 1). Patient could not afford advanced imaging technique ie CTSCAN. The patient was prepared for surgical retrieval of the dental needle fragment following baseline investigations. Packed Cell Volume as well as serum electrolytes, urea and creatinine were done and found to be within normal range. Blood was also cross matched for the procedure.

Procedure

The patient was positioned supine on the operating table. Routine skin preparation using 70% alcohol and iodine and draping was done under induction of general anaesthesia and endotracheal intubation. Cefuroxime 500mg and 200mg of Metronidazole were given intravenously prior to commencement of the procedure. Intraoperatively, 4mg of Dexamethasone and 500mg of Paracetamol were also given intravenously. The procedure lasted about 2hrs. There was no transfusion of blood.

An intraoral vertical incision along the ascending ramus was made and extended with a transverse incision along the buccal mucosa below the occlusal level of the posterior teeth. Blunt dissection was done to expose the ascending ramus and coronoid process. As the incision along the buccal mucosa was deepened, the buccal fat pad was exposed and this was gently tensed out to expose the tip of the needle. The 27 G needle

fragment was pulled out with haemostatic forceps (Figure 2). The operation site was irrigated with normal saline and sutured in layers with interrupted 3/0 vicryl sutures.

The procedure lasted about 2hrs. There was no transfusion of blood. The patient was maintained on Cefuroxime 500mg 12hrly and 200mg of Metronidazole 8hrly and paracetamol 500mg 8hrly for 48hours and encouraged to gargle with warm saline mouth rinse before and after each meal. She was discharged after a week home on oral medications: Augmentin 375mg 12 hrly; Metronidazole 200mg 8hrly and paracetamol 500mg 8hrly for one week. A moderate trismus was noticed. Patient was encouraged to exercise her jaw and was reviewed regularly on outpatient basis for two weeks.

Discussion

Inferior alveolar nerve blocks are administered routinely for a variety of dental and oral surgical procedures. Breakage of dental needles, though rare, may occur during administration of inferior nerve block prior to dental procedures. Local anaesthetic administration is the most common procedure in dental practice in many parts of the world^{2,5,6}.

Although needle breakage is uncommon nowadays, it can be a stressful event for the patient and dentist alike and this report serves as a reminder^{1,2}. Unexpected movement of the patient during administration of local anaesthesia, use of inappropriate needles, repeated needle use, and redirection of the needle during anaesthesia are the most common causes of needle breakage⁴. In this case, the patient was reported to have



Figure 2: Retrieved Broken Needle



Figure 1: Lateral view of the skull showing location of needle in the pterygomandibular space.

jumped suddenly while receiving the nerve block following which the needle got broken. In the event of needle breakage, every effort should be made to retrieve the needle immediately. The use of a fine hemostat may be useful if the broken end of the needle is visible intra orally. If the needle disappears completely and is non retrievable; as reported in this case the following management protocol should be followed.

Management protocol/algorithm

The following table on management protocol was developed by Naomi *et al*³

If a needle is broken during administration of an inferior alveolar block:

If it is still visible

Define the needle entry point

Attempt retrieval with a fine artery forceps

If it is not visible

Define the entry point with mouth open

Reassure the patient

Caution against excessive mouth opening which may cause the needle to move deeper into the tissues.

Mark the site where needle penetration occurred with an indelible marker

Arrange referral to a maxillofacial surgeon

Send the remainder of the needle and the hub and a fresh needle with the patient so as to estimate length of remaining needle

Write accurate notes concerning the event

Follow up care of the patient

Inform your dental defence company if any

Discuss the management of the patient with your team³

Needle Factors

The prevention of broken needles begins before any dental procedure as routine needles inspection and discarding those with any defect. The various factors that have been found to be responsible for needle fracture include the following:

1. Repeated punctures with the same needle should be avoided, because it makes it weak and susceptible to breakage¹.

2. The bending of needle before its introduction into the soft tissues can make it become more susceptible to fracture, especially when it makes contact with the bone.

3. The full introduction of the needle inside the tissue and changes in the direction of the needle pathway inside the tissue also increases the chances of fractures.

4. The caliber and needle size used for inferior alveolar nerve block is a divergent factor. Needles shorter than 42 mm or smaller than 25G should be used for this block. Needle caliber less than 30 G are stringer, presents minimal stiffness therefore should not be used for nerve blocks because they are more susceptible to breakage. The use of needles with Caliber of 27 and 35 mm for the inferior alveolar nerve block, and avoiding the total introduction of needles to prevent fractures have been recommended³. The 27G needle used by the dentist in this report has also been shown to be more difficult to direct properly through tissue because of its inherent weakness and flexibility⁵.

5. False technique include aggressive insertion of a needle into the tissue, sudden changes in the direction inside the tissue or a too deep penetration of the needle⁷

Patient Factors

The patient cooperation is essential in order to avoid any sudden or unexpected movement during anesthesia that can contribute to the needle fracture as observed in this case. Aggressive insertion can lead to sudden movement of the patient.

In our environment there is increasing cases of Attention Deficit Hyperactive Disorder (ADHD) Autistic Spectrum Disorders (ASD) patients there is therefore the need to learn how to identify and manage the anxious and hyperactive child that comes for dental procedures⁸.

Radiological Factors

Various methods are available in the literature on locating a broken needle in the pterygomandibular space. Plain radiographs taken at right angles to each other (dental panoramic radiograph and postero anterior view of the mandible) are usually the first choice. Others are stereotactic devices and image intensifiers. There has been reported use of C-arm digital fluoroscopes which involves taking multiple fluoroscopic images to accurately locate the needle. The gold standard to accurately establish needle position are 3 D CT scans^{4,5,9}.

However, in this study posterior anterior view and lateral oblique view were used due to paucity of funds.

Surgical Techniques

Generally two surgical approaches have been advocated for surgical exploration¹⁰. The first method involves a vertical mucosal incision on the medial aspect of the mandibular ramus with blunt supra-periosteal dissection. The second method relies on an incision along the external oblique ridge followed by sub periosteal dissection. The broken needle may then be explored by blunt supra -periosteal dissection. The former technique combined with transverse incision along buccal mucosal were employed in this case. This helped to identify and protect the inferior alveolar and lingual nerves.

Complication

There is some controversy in the literature regarding the removal of broken dental needles. Some authors have suggested that removal is not necessary unless the patient developed symptoms such as pain, infection, numbness, dysphagia, trismus, and swelling^{11,12,13,14}. On the other hand, many authors have suggested removal on account of the possibility of needle migration or infection^{5,15,16}.

Other complications such as the needle migrating towards vital structures as far as the skull base including blood vessels or nerves can occur^{1, 13}. Possible sites that could be affected by migration include the lateral pharyngeal space, where the styloglossus muscle, the ascending pharyngeal artery and the external carotid all lie¹. It is therefore recommended that the needle should be removed to alleviate patient anxiety and decrease the possibility of further complication.

Conclusion

Dental needle breakage is a rare complication in modern practice. Children have been known to be very fearful and restless while taking injections which may predispose to dental needle breakage. As reported in this case It is imperative that the Dental Surgeon should be more conversant with behavioural technique in the management of the restless and hyperactive children. Two major surgical techniques have been reported in literature for the retrieval of broken dental needle in the pterygomandibular space. One of these was employed in this case. Surgical retrieval should

be done when it is absolutely indicated as in this case. The use of advanced imaging techniques have been advocated for proper identification and ease of surgical retrieval, however this advantage could not be utilized in this case due to financial constraint.

References

1. Prado F.B., Caria P.H.F. and Silva R.F. A case of dental broken needle migration to the skull base. Anatomical considerations and prevention. *J. Morphol. Sci.*, 2010; 27(2): 98-101
2. Lusting J.P. and Zusman S.P. Immediate complications of local anesthetic administered to 1007 consecutive patients. *J. Am Dental Assoc.* 1999;130: 496-499
3. Naomi R., Clarke M. and Stenson F.A. Case Report: management of broken Dental needle in practice. *J. Irish Dental Assoc.* 2013; 59(5): 241-245
4. Ho K.H. A simple technique for localizing a broken dental needle in the pterygomandibular region. *Aust Dent J* 1988; 33: 308-309
5. Thompson M., Wright S. and Cheng L.H. Locating broken dental needles. *Int J Oral Maxillofac Surg.* 2003; 32: 642-644
6. Malamed S.F., *Handbook of local anaesthesia.* 2nd ed., Mosby, St Louis. 1986; 230-231.
7. Sakkinen J., Huppunen M. and Suuronen R. Complication following local anaesthesia Nor Tannlegeforen Tid. 2005; 115: 48-52
8. Oladipo G. S., Okoh P. D. and Oghenemavwe L. E. Dermatoglyphic Patterns of Autistic Children in Nigeria *J. of Biol. Agric. and Healthcare* www.iiste.org. 2013; 3:7
9. Seltzer R. Cohen C. and Casap N. The implication of a broken dental needle in pterygomandibular space. *Clinical guidelines for prevention and retrieval. Paediatric Dent.* 2002; 24:153-156
10. Brown L.J. Meerkotter V.A. An unusual experience with a broken needle. *J Dent Assoc S Afr.* 1963; 18: 74.
11. Faura-Solé M., Sánchez-Garcés M.A. and Berini-Aytes L. Broken anesthetic injection needles: report of 5 cases. *Quintessence Int.* 1999; 30: 461-465
12. Bedrock R.D., Skigen A. and Dolwick M.F. Retrieval of a broken needle in the pterygomandibular space. *J Am Dent Assoc.* 1999; 130:685-687
13. Fitzpatrick B. The broken dental needle. *Aust*

Dent J. 1967; 12: 243-245

14.Behbahan E., Anderson L., Al Haddad A. A survey of Dental Local anesthesia routines and experience of fractured needle. Dental news. 2006;1

15.Bhaha S, Bounds G. A broken dental needle in the pterygomandibular space. Report of a case and review of literature. Dent Update

1998;25:35-37

16.Bruno Ramus Chrcanovia, Djaima Cordeiro Menezes, Antonio Luis Neto Custama. Complication of local dental anesthesia - a broken dental needle in the pterygomandibular space Braz J Oral.Surg.8(3): 159-162

TROPICAL JOURNAL OF HEALTH SCIENCES

GUIDELINES OF AUTHORS

The Tropical Journal of Health Sciences accords special interest and high priority to: original work: research and training innovations and clinical observations. Articles submitted to The TJHS should not be under consideration for publication by another journal nor should such an article have been previously published elsewhere except as a conference abstract.

Contributions may be made as original research papers, short communications, case report, solicited review articles, commentary, correspondence and book review articles, commentary, correspondence and book reviews offered exclusively to the journal.

To accelerate publication of any contributions editorial instructions and policies should be strictly followed when submitting manuscripts for consideration.

Manuscripts should be typewritten on A4 size paper in clear and concise English. Expression of language should be simple. Local vernaculars may be employed only when their use is unavoidable. Articles should be typed on one side of paper only with double spacing and ample margins. Page number should be done in a conservative manner. Manuscripts, figures and tables should be submitted in three copies (One original and two clear photocopies) plus an electronic copy in word format in floppy disket or CD or by email. Articles from outside Ilorin should included two large envelopes (15ins by 20ins or 37 cm by 25 cm) stamped with two hundred Naira (#200) stamps each and one of the two should be self addressed to:

The Editor-in-Chief,
The Tropical Journal of Health Sciences,
C/oProvost's Office,
College of Health Sciences,
University of Ilorin,
P.M.B. 1515, Ilorin,
Nigeria,
Email: tjhs_ilorin@yahoo.com

Manuscripts should be presented in the following order and all pages numbered consecutively (Title

page, Abstracts, Introduction, Materials and Methods, Results, Discussion, Acknowledgment, References, Tables and Figure Legends). Abstracts should not be more than 250 words. Appropriate position of figures and tables in the text should be indicated.

International acceptable nomenclature and unit of scientific measurement, System International (S.I) should be used consistently. The 24 hour system should indicate time e.g 0900H. No sentence should begin with Arabic numerals.

Authors are responsible for accuracy of all references in the text and the list at the end of the paper. Only indispensable references should be used. Citation in the text should appear as consecutive numbers in superscript. All the cited references should be listed serially at the end of the paper, using the format in *Index Medicus* in accordance with the "Vancouver Convention" style of referencing.

List of references of article in regular journals should contain (i) Name(s) and initial(s) of author(s) (ii) Full title of article (iii) Name of Journal (iv) First and last pages.

The journal format must be strictly adhered to in preparation of manuscripts. Authors should ensure accuracy of spellings and other details to avoid undue delay in the editorial review.

This journal will publish results of research involving human subjects and patients only if such a study has been conducted after appropriate clearance from the Medical Ethics Committee of the host institution. Articles published in the journal represents the opinion of the author(s) and not those of editors or publishers. From January 2011 Edition, authors will be charged Ten Thousand Naira (N10,000) or Eighty Dollars (\$80) for each article accepted for production.

Manuscripts will be reviewed anonymously by at least two assessors. However, the final decision to accept or reject any manuscript will be made by the Editor-In-Chief.

